(2)

UNITED STATES AIR FORCE

EPI REPORT

ELECTRONIC PRINCIPLES

AIR FORCE MILITARY TRAINING CENTER (AFMTC)

AFSC 30650

AFPT 90-EPI-825

FEBRUARY 1990

OCCUPATIONAL ANALYSIS PROGRAM
USAF OCCUPATIONAL MEASUREMENT CENTER
AIR TRAINING COMMAND
RANDOLPH AFB, TEXAS 78150-5000

DISTRIBUTION FOR
AFSC 30650 (AFMTC) OSR AND SUPPORTING DOCUMENTS

	OSR	JOB INV
ARMY OCCUPATIONAL SURVEY BRANCH	1	
DEFENSE TECHNICAL INFORMATION CENTER	2	
DET 1, USAFOMC (LACKLAND AFB TX)	1	1
HRL/MODS	2	
HRL/ID	1	
HQ ATC/TTOK	2	
NODAC	1	
3250 TCHTW/TTGX (LACKLAND AFB TX)	4	2
3250 TCHTW/TTS (LACKLAND AFB TX)	1	
USAFOMC/OMYXL	10	10
USMC (CODE TE-310)	1	

Accession For	
NTIS CRA&I	☑
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

TABLE OF CONTENTS

PREFACE

This report presents the results of an Air Force Electronic Principles survey of AFSC 30650, Electronic Communications and Cryptographic Equipment Systems Specialist. Authority for conducting Electronic Principles (EP) surveys is contained in AFR 35-2.

Results presented in this report are part of an EP survey of 81 Air Force specialties. This survey was requested by the Chief, Common Electronics Training Program (CETP) Program Management Team (PMT) in October 1985.

The Electronic Principles Inventory (EPI) used to collect EP survey data was originally developed in 1976 by Dr Hendrick Ruck and Major Thomas O'Connor. Mr Theodore Wilcox revised and validated the EPI in 1986 as part of this survey project.

First Lieutenant Robert Hampel analyzed the data and wrote the final report. Computer programming support was provided by Ms Olga Velez and Mr Wayne Fruge, and Ms Raquel A. Soliz provided administrative support. This report was reviewed and approved by Mr Gerald Clow, Chief, Management Applications Branch, Occupational Analysis Division, USAF Occupational Measurement Center.

This report is distributed to Air Staff sections, major commands, and other training and management personnel. Requests for additional copies should be sent to Chief, Occupational Analysis Division (OMY), USAF Occupational Measurement Center Randolph AFB, Texas 78150-5000.

BOBBY P. TINDELL, Colonel, USAF
Commander
USAF Occupational Measurement Center

JOSEPH S. TARTELL
Chief, Occupational Analysis Division
USAF Occupational Measurement Center

REPORT SUMMARY

1. BACKGROUND: This report provides data on electronic principles (EP) used by DAFSC 30650 personnel. This data provides insight on EP training needs for 306X0 personnel.

2. METHODOLOGY: The USAF Electronic Principles Inventory (AFPT 90-EPI-825, June 1987) was administered to a randomly selected sample of fully qualified job incumbents in DAFSC 30650. The data were collected from September 1987 to April 1988.

3. RESULTS: Complete survey data is provided in three appendices. A "generic" version of the Electronic Fundamentals/Applications (EF/A) is used in Appendix B--complete analysis requires the use of 30650 proficiency codes, rather than the generic set used in the Appendix. The POI for course L3ABR30630 was largely supported by survey data. Survey data showed 69 EPI items not referenced to the POI that were used by at least 30 percent of the sample. These items should be considered for inclusion into the POI. Following is a list of all appendices:

Appendix A: 30650 EP data in EPI job inventory order
Appendix B: 30650 EP data matched to Electronic Fundamentals/Applications (EF/A) STS
Appendix C: 30650 EP data matched to POI L3ABR30630, dated 22 September 1986

4. DISCUSSION: This EP survey data shows the operational use of electronic principles by fully qualified, worker-level job incumbents in the 306X0 specialty. Presently, there is no specific regulatory guidance on the use of EPI survey data; however, this data does provide insight into the EP training requirements for 306X0 personnel.

ELECTRONIC PRINCIPLES SURVEY REPORT
DAFSC 30650

INTRODUCTION

From missile systems maintainers to telephone switching specialists, from avionics technicians to biomedical equipment personnel, the U.S. Air Force employs more than 50,000 worker-level (primarily 5-skill level) personnel who require electronic principles (EP) training. These highly skilled, technically trained airmen work in over 80 Air Force specialties (AFSs) spanning 11 career fields. Furthermore, the depth and breadth of required EP training varies based on specialty needs. In short, the USAF spends vast amounts of money, manpower, and time to ensure that airmen are properly trained in electronic principles.

To make the best use of these resources, the USAF Common Electronics Training Program (CETP) was designed to consolidate and standardize Air Force EP training where possible and practical. This is primarily accomplished through special EP courses taught at four USAF Technical Training Centers (TTCs). These EP courses teach the electronic principles common to two or more AFSs. Another part of the CETP is the development of common training modules. Specific blocks of EP instruction are developed by one TTC, then shared with the other TTCs which teach that EP subject. By selectively combining and standardizing Air Force EP training, the USAF makes best use of limited training resources.

Not all Air Force electronic principles training is conducted in special EP courses, however. For example, some EP subjects are used in only one AFS. Students learn these generally advanced topics in AFSC-awarding courses, building on the more basic EP subjects from the common EP course. Also, some AFSs require very few electronic principles, and airmen in these specialties receive EP training only in their AFSC-awarding courses.

As with other Air Force technical training, EP training programs can profit from objective analysis of specific training requirements. These requirements can be analyzed objectively using occupational survey data. This EP survey provides data which can be used to analyze the specific EP training requirements in CETP courses and AFSC-awarding courses alike. The instrument used to collect EP survey data is the Electronic Principles Inventory (EPI).

BACKGROUND

The USAF Electronic Principles Inventory (EPI) is a knowledge- and skills-based job inventory which identifies the electronic principles, skills, and equipment an airman uses in the performance of his or her job.

The EPI was originally developed by Dr Hendrick Ruck and Major Thomas O'Connor in 1976. An in-depth discussion of the original concept, development, and validation of the EPI can be found in USAFOMC Technical Note 77-02, "The Development and Application of the Electronic Principles Job Inventory". Mr Theodore Wilcox revised and validated the EPI in 1986 for this survey.

The EPI contains two sections. First is a background section containing demographic and job satisfaction questions. The second section contains 712 electronic principles, skills, and equipment questions covering 39 EP subject areas. Below are some example questions taken from the EPI. The 39 EPI subject areas are listed in Table 1.

After completing the background section, job incumbents respond "Yes" or "No" to the 712 EPI questions. The result is a "profile" of electronic principles, skills, and equipment used by the incumbent in his or her present job. This electronic principles "profile" can be combined with the "profiles" of other job incumbents to produce a "profile" for the entire AFS.

EXAMPLE EPI QUESTIONS

Example Principles Questions

A4-4 Do you use electron tube characteristic curves?
G1-20 Do you use parity bit codes?
H4-33 Do you use "FM" modulation principles?

Example Skills Questions

C1-8 Do you calculate values of transistor amplifier voltage, current, or power gain?
E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters?
I1-4 Do you measure RF effective power?

Example Equipment Questions

B4-2 Do you use spectrum analyzers?
D3-5 Do you perform tasks on variable resistor voltage regulators?
J1-8 Do you work on dynamic microphones?

TABLE 1

EPI SUBJECT AREAS

SUBJECT AREA NUMBER	SUBJECT AREA TITLE
A1	Direct/Alternating Current
A2	Electro/Mechanical Devices
A3	Solid-State Circuits and Devices
A4	Tubes
A5	Soldering or Solderless Connections
B1	Multimeters
B2	Oscilloscopes
B3	Signal (Function) Generators
B4	Test Equipment
C1	Transistor Amplifier Circuits
C2	Transistor Amplifier Stabilization Circuits
C3	Coupling Circuits
C4	Electron Tube Amplifier Circuits
C5	Operational Amplifiers
C6	Magnetic Amplifiers
D1	Power Supply Circuits
D2	Power Supply Filters
D3	Power Supply Voltage Regulators
E1	Resistive Capacitive Inductive Circuits
E2	Frequency Sensitive Filters
F1	Oscillators
F2	Multivibrators
F3	Waveshaping Circuits
F4	Limiter/Clamper Circuits
G1	Digital Logic Numbering Systems and Functions
G2	Computers
G3	Digital Circuits
G4	Digital to Analog (D/A) and Analog to Digital (A/D) Converters
H1	Connections (Transmission Lines and Waveshaping Circuits)
H2	Microwave Oscillators and Amplifiers
H3	Resonant Cavities
H4	Transmitters and Receivers
H5	Antennas
I1	Radio Frequency Measurements
I2	Radio Frequency Calculations
J1	Microphones and Speakers
J2	Photosensitive Devices
J3	Storage Type Display Tubes
J4	Television, Laser, and Infrared Systems

SURVEY ADMINISTRATION

As mentioned in the PREFACE, data were collected for this survey from over 80 AFSs (78 AFSs, 3 Reporting Identifiers). Survey data were collected in four increments, from March 1987 through March 1989. A total of 24,651 EPI booklets were mailed to active duty airmen worldwide. After each of the first three increments, interim survey reports were published by USAFOMC. These reports are all numbered AFPT 90-EPI-825, and are dated July 1988 (EPI-1), January 1989 (EPI-2), and February 1989 (EPI-3). There was no separate report of data collected in EPI-4. Results were combined with those of the first three increments to produce the final reports. There are a total of five final EPI reports, one for each of the following: Chanute TTC, Keesler TTC, Lowry TTC, Sheppard TTC, and the Air Force Military Training Center (AFMTC) located at Lackland AFB. This report presents results only for DAFSC 30650, Electronic Communications and Cryptographic Equipment Systems Specialist.

Survey administration for 30650 was from September 1987 through April 1988. Of 1,313 DAFSC 30650 personnel assigned, 987 were eligible to take the survey; that is, they had at least 4 weeks' experience in their job, and were not within 90 days of retirement nor expecting reassignment within 60 days. A random sample of 377 was selected, and booklets were mailed to 30650 airmen worldwide. All useable EPI booklets that were returned to USAFOMC were included in the final sample, which numbered 235.

RESULTS

Each completed EPI survey booklet shows which electronic principles the respondent uses in his or her present job. When the responses of all survey respondents from a specific group are combined, the results are shown as percent of group members using each of the 712 EP items. Complete survey results are listed in Appendix A, which shows the percent of sample members responding "Yes" to each of the 712 EPI items.

Collectively, 30650 personnel used 662 of the 712 EPI items. However, the highest number of EPI items used by any 30650 survey respondent was 446, while the person who used the least number of EPI items used only eight. On the average, 30650 sample members used 174 of the 712 EPI items.

Training Analysis

One of the primary reasons for collecting EPI data is to determine the EP training needs of Air Force personnel, and consequently, how well USAF technical training supports those needs. To this end, subject-matter experts (SMEs) matched EPI items to appropriate block(s) of the Electronic Fundamentals/ Applications (EF/A) part of the Specialty Training Standard (STS), known as the STS Attachment 2.

For this study, a "generic" version of the EF/A STS was used for the match--that is, all blocks of the EF/A were matched, and the proficiency codes are NOT specific to the 306X0 STS. Still, this match of EPI items to the EF/A STS can be used to determine which blocks of the STS Attachment 2 should be included in the 306X0 STS, and should be reviewed for this purpose. The match of EPI items (with corresponding survey data) to the "generic" EF/A STS is located in Appendix B of this report.

Subject-matter experts also match EPI items to Plans of Instruction (POIs) for Air Force courses which teach electronic principles. Once the EPI items are matched to the appropriate POI block(s), the percent of group members responding "Yes" to those matched items can show how well the particular block of instruction is supported. For example, if many group members respond "Yes" to the EPI items matched to a block of instruction, then that block is considered well supported by survey data. If, however, few group members respond "Yes", this indicates little support for the POI block under consideration.

For this study, SMEs matched the 712 EPI items to the POI for course L3ABR30630, dated 22 September 1986. This match (with 30650 survey data) is shown as Appendix C of this report. The first section shows the EPI items matched to the POI, while the second section shows the EPI items which were not referenced to any POI block.

Most of the POI was supported by survey data. In fact, only one section (Block I, Item 1a) is recommended for review due to low percent members responding "Yes". Furthermore, 69 EPI items not referenced to the POI had at least 30 percent of sample members responding "Yes". Examples of these unreferenced items are included in Table 2, and the complete listing can be found in Appendix C under "TASKS NOT REFERENCED". These 69 items should be considered for inclusion into the EP section of the course.

TABLE 2

EXAMPLE EPI ITEMS NOT REFERENCED TO POI WITH AT LEAST 30 PERCENT OF DAFSC 30650 MEMBERS RESPONDING YES

TASK NUMBER/TASK TITLE		PERCENT MEMBERS RESPONDING "YES"
A5-06	Do you use crimping tool to repair or make connections	88
B4-01	Do you use frequency counters	83
A1-16	Do you troubleshoot circuits to isolate a faulty relay	78
A5-10	Do you repair or fabricate connectors or cables on coaxial cables	72
A5-07	Do you use wire wrap tool to make connections	71
A5-09	Do you repair or fabricate connectors or cables on multiconductor cables	70
F1-03	Do you troubleshoot to isolate a faulty oscillator circuit	65
F1-04	Do you troubleshoot oscillators to circuit level components	59
A1-19	Do you continuity check relays	58
F2-04	Do you troubleshoot multivibrators to circuit level components	56
A1-18	Do you perform tasks on contacts, cores, coils, armatures, or springs	43
A1-25	Do you calibrate or adjust circuits by using variable inductors	43
A1-32	Do you calibrate or adjust circuits using variable capacitors	43
C1-06	Do you adjust or align transistor amplifiers	38
G4-03	Do you troubleshoot A/D converter circuits	36
B3-09	Do you use pattern signal generators	33
G3-23	Do you perform tasks on comparators	32

DISCUSSION

ATC Regulation 52-22 provides direct and specific guidance on the use of occupational survey data in the development of Specialty Training Standards and centralized training programs; however, the guidelines deal with the use of task data, not principles data. Concerning electronic principles, the regulation states only that "EPI studies provide valuable information for curriculum development or validation in terms of percent members requiring a range of electronics principles knowledge in the performance of their job." Though there are no hard and fast rules for using EPI data, training personnel should consider EPI survey results when developing or refining EP training program content.

Following is a summary of the Appendices:

Appendix A: 30650 EP data in EPI job inventory order
Appendix B: 30650 EP data matched to Electronic Fundamentals/Applications (EF/A) STS
Appendix C: 30650 EP data matched to POI L3ABR30630, dated 22 September 1986

As mentioned throughout this report, the data contained in these appendices show the use of EP data by 30650 personnel, and consequently provide insight into the EP training needs of airmen in the Electronic Communications and Cryptographic Equipment Systems specialties (AFSC 306X0).

T A B L E O F C O N T E N T S

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Module Statement						

Description of Reported Task Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Task Statement						
2	F0083	GP0089/PMP	All DAFSC 30650	235	24.48	25.37	97.45	.00	712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in job inventory order.
Data for this report was collected from job incumbents during the period September 1987 - April 1988

Percent members responding "YES" is shown for each specialty listed.

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6811.

D T Y	Tsk Nbr	Task Title	306 50
0001		EPI Electronic Principles Inventory	
0002		I. General Electronic/Electricity	
0003		I 1. A1 Direct/Alternating Current	
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)	73
A	2	A1-2 Do you use basic DC electrical/electronic terms	97
A	3	A1-3 Do you use basic AC electrical/electronic terms	95
A	4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries	93
A	5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	94
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power	45
A	7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage	45
A	8	A1-8 Do you calculate values of frequency, phase relationship, or wave length	46
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors	89
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor	84
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors	83
A	12	A1-12 Do you calculate the value of a resistor required for a circuit	48
A	13	A1-13 Do you determine ohmic value of a resistor using the color code	75
A	14	A1-14 Do you ohm check resistors	83

D T Y	Tsk Nbr	Task Title	306 50
A	15	A1-15 Do you trace schematic or block diagrams of circuits containing relays	79
A	16	A1-16 Do you troubleshoot circuits to isolate a faulty relay	78
A	17	A1-17 Do you adjust relays	41
A	18	A1-18 Do you perform tasks on contacts, cores, coils, armatures, or springs	43
A	19	A1-19 Do you continuity check relays	58
A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils	67
A	21	A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil	65
A	22	A1-22 Do you calculate values of circuit total inductance	23
A	23	A1-23 Do you calculate values of circuit or component inductive reactance	21
A	24	A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors	26
A	25	A1-25 Do you calibrate or adjust circuits by using variable inductors	43
A	26	A1-26 Do you ohm check inductors	57
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors	85
A	28	A1-28 Do you troubleshoot circuits to isolate a faulty capacitor	83
A	29	A1-29 Do you calculate values of circuit total capacitance	31
A	30	A1-30 Do you calculate values of circuit or component capacitive reactance	27
A	31	A1-31 Do you calculate values of circuit or component voltage or current in circuits containing capacitors	31
A	32	A1-32 Do you calibrate or adjust circuits using variable capacitors	43
A	33	A1-33 Do you ohm check capacitors	78
A	34	A1-34 Do you use capacitor color codes in your present job	23
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers	80
A	36	A1-36 Do you troubleshoot circuits to isolate a faulty transformer	77
A	37	A1-37 Do you calculate transformer voltage or current step-up or step-down ratios	35
A	38	A1-38 Do you calculate impedance of transformers	22
A	39	A1-39 Do you calibrate or adjust circuits using variable transformers	25
A	40	A1-40 Do you ohm check transformers	65
A	41	A1-41 Do you measure transformer output voltage	73
A	42	A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers	29
A	43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer	27
A	44	A1-44 Do you adjust three phase transformers	17

D T Y	Tsk Nbr	Task Title	306 50
0004	I 2.	A2 Electro/Mechanical Devices	
A	45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors	23
A	46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor	23
A	47	A2-3 Do you troubleshoot DC motor component parts	13
A	48	A2-4 Do you perform tasks on DC motor component parts	14
A	49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors	23
A	50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor	22
A	51	A2-7 Do you troubleshoot AC motor component parts	11
A	52	A2-8 Do you perform tasks on AC motor component parts	14
A	53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	4
A	54	A2-10 Do you troubleshoot to isolate a faulty DC generator	4
A	55	A2-11 Do you troubleshoot DC generator component parts	4
A	56	A2-12 Do you perform tasks on component parts of DC generators	4
A	57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	4
A	58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	4
A	59	A2-15 Do you troubleshoot AC generator component parts	3
A	60	A2-16 Do you perform tasks on component parts of AC generators	3
A	61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	2
A	62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	1
A	63	A2-19 Do you troubleshoot alternator component parts	1
A	64	A2-20 Do you perform tasks on component parts of alternators	1
A	65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	7
A	66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	7
A	67	A2-23 Do you troubleshoot synchro or servo component parts	6
A	68	A2-24 Do you perform tasks on component parts of synchros or servos	6
A	69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers	2
A	70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper	2
A	71	A2-27 Do you measure chopper coil excitation frequency	1
A	72	A2-28 Do you measure chopper coil voltage-current phase relationship	1

D T Y	Tsk Nbr	Task Title	306 50
A	73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers	3
A	74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer	4
A	75	A2-31 Do you calibrate or adjust transducers	3
A	76	A2-32 Do you repair, clean or lubricate transducers	3
A	77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids	7
A	78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid	7
A	79	A2-35 Do you perform maintenance on solenoid component parts	4
A	80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	27
A	81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement	26
A	82	A2-38 Do you perform maintenance on meter movement mechanical parts	12

0005 I 3. A3 Solid State Circuits and Devices

A	83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	81
A	84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	80
A	85	A3-3 Do you check diodes using an ohmmeter	78
A	86	A3-4 Do you use diode characteristic curves	16
A	87	A3-5 Do you use diode substitution information	39
A	88	A3-6 Do you use diode color codes	30
A	89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors	85
A	90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor	84
A	91	A3-9 Do you check transistors using an ohmmeter	82
A	92	A3-10 Do you check transistors using transistor testers	50
A	93	A3-11 Do you use transistor characteristic curves	16
A	94	A3-12 Do you use transistor substitution information	40
A	95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)	74
A	96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	69
A	97	A3-15 Do you use IC substitution information	36
A	98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	54
A	99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device	51
A	100	A3-18 Do you perform tasks on varactors/varicaps	28
A	101	A3-19 Do you perform tasks on tunnel diodes	23
A	102	A3-20 Do you perform tasks on field effect transistors (FET)	36
A	103	A3-21 Do you perform tasks on unijunction transistors (UJT)	45
A	104	A3-22 Do you perform tasks on zener diodes	69

D T Y	Tsk Nbr	Task Title	306 50
A	105	A3-23 Do you perform tasks on liquid crystal displays (LCD)	26
A	106	A3-24 Do you perform tasks on pin diodes	17
A	107	A3-25 Do you perform tasks on light emitting diodes (LED)	49
A	108	A3-26 Do you perform tasks on fantail transistors	12
A	109	A3-27 Do you perform tasks on silicon controlled rectifiers (SCR)	49
A	110	A3-28 Do you perform tasks on triacs	9
A	111	A3-29 Do you perform tasks on programmable unijunction transistors (PUT)	7
A	112	A3-30 Do you perform tasks on silicon controlled switches (SCS)	12
A	113	A3-31 Do you perform tasks on silicon unilateral switches (SUS)	6
A	114	A3-32 Do you perform tasks on step recovery diodes (SRD)	7
A	115	A3-33 Do you perform tasks on field effect diodes (FED)	14
A	116	A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode)	6
A	117	A3-35 Do you perform tasks on varistors	51
A	118	A3-36 Do you perform tasks on metal oxide varistors (MOV)	7
A	119	A3-37 Do you perform tasks on schottky diodes	5

0006 I 4. A4 Tubes

A	120	A4-1 Do you trace block diagrams of circuits containing electron tubes	32
A	121	A4-2 Do you trace schematic diagrams of electron tube circuits	31
A	122	A4-3 Do you troubleshoot circuits to isolate a faulty electron tube	31
A	123	A4-4 Do you use electron tube characteristic curves	8
A	124	A4-5 Do you use electron tube substitution manuals or charts	14
A	125	A4-6 Do you perform tasks on diode tubes	21
A	126	A4-7 Do you perform tasks on triode tubes	23
A	127	A4-8 Do you perform tasks on tetrode tubes	22
A	128	A4-9 Do you perform tasks on pentode tubes	21
A	129	A4-10 Do you perform tasks on beam power tubes	3
A	130	A4-11 Do you perform tasks on gas tubes	13
A	131	A4-12 Do you perform tasks on phantastrons	2
A	132	A4-13 Do you perform tasks on neon tubes	6
A	133	A4-14 Do you perform tasks on xenon tubes	3
A	134	A4-15 Do you perform tasks on nixie tubes	3
A	135	A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT)	6
A	136	A4-17 Do you trace schematic diagrams of CRT circuits	6
A	137	A4-18 Do you troubleshoot to isolate a faulty CRT	6
A	138	A4-19 Do you adjust or calibrate circuits that control CRT operations	6

D T Y	Tsk Nbr	Task Title	306 50
A	139	A4-20 Do you perform tasks on electrostatic CRT	4
A	140	A4-21 Do you perform tasks on electromagnetic CRT	2

0007 I 5. A5 Soldering or Solderless Connections

A	141	A5-1 Do you solder or desolder hardwire connections	96
A	142	A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc	88
A	143	A5-3 Do you solder or desolder printed circuit board connections	81
A	144	A5-4 Do you solder or desolder multi-layer circuit board connections	25
A	145	A5-5 Do you perform high reliability soldering	67
A	146	A5-6 Do you use crimping tool to repair or make connections	88
A	147	A5-7 Do you use wire wrap tool to make connections	71
A	148	A5-8 Do you use punch-on tool to make connections	62
A	149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables	70
A	150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables	72
A	151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables	31
A	152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables	30

0008 II. Test Equipment

0009 II 1. B1 Multimeters

B	153	B1-1 Do you use the multimeter to measure DC voltage values	97
B	154	B1-2 Do you use the multimeter to measure AC voltage values	94
B	155	B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts	19
B	156	B1-4 Do you use the multimeter to measure DC current values	77
B	157	B1-5 Do you use the multimeter to measure AC current values	70
B	158	B1-6 Do you use the multimeter to extend the range of ammeters using external shunts	14
B	159	B1-7 Do you use the multimeter to measure circuit resistance	74
B	160	B1-8 Do you use the multimeter to measure component resistance	85

D T Y	Tsk Nbr	Task Title	306 50
0010	II 2.	B2 Oscilloscopes	
B 161	B2-1	Do you use the oscilloscope to measure time to determine frequency	74
B 162	B2-2	Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	76
B 163	B2-3	Do you use the oscilloscope to measure AC voltage	86
B 164	B2-4	Do you use the oscilloscope to measure DC voltage	90
B 165	B2-5	Do you use the oscilloscope to measure ripple voltages	87
B 166	B2-6	Do you use the oscilloscope to measure phase jitters	42
B 167	B2-7	Do you use the oscilloscope to observe signal/data patterns	89
B 168	B2-8	Do you use the oscilloscope to observe lissajous patterns	62
B 169	B2-9	Do you use the oscilloscope to observe phase relationships	66
B 170	B2-10	Do you use attenuator probes with oscilloscopes	69
B 171	B2-11	Do you use delay time multipliers with oscilloscopes	25
0011	II 3.	B3 Signal (Function) Generators	
B 172	B3-1	Do you use signal generators (SG) to perform operational checks	60
B 173	B3-2	Do you use SG to perform alignments, adjustments, or calibrations	60
B 174	B3-3	Do you use SG to troubleshoot circuits	58
B 175	B3-4	Do you use audio sine-wave signal generators	54
B 176	B3-5	Do you use audio non-sinusoidal signal generators	17
B 177	B3-6	Do you use RF less than 1,000MH signal generators	19
B 178	B3-7	Do you use RF greater than 1,000MH signal generators	9
B 179	B3-8	Do you use white noise signal generators	7
B 180	B3-9	Do you use pattern signal generators	33
B 181	B3-10	Do you use pseudo-random signal generators	12
B 182	B3-11	Do you use time mark signal generators	11
B 183	B3-12	Do you use multi-function (square/sine/triangular) signal generators	34
B 184	B3-13	Do you use TV signal signal generators	3
0012	II 4.	B4 Test Equipment Types	
B 185	B4-1	Do you use frequency counters	83
B 186	B4-2	Do you use spectrum analyzers	15

D T Y	Tsk Nbr	Task Title	306 50
B	187	B4-3 Do you use field strength testers	3
B	188	B4-4 Do you use digital multimeters	95
B	189	B4-5 Do you use digital logic probes	17
B	190	B4-6 Do you use capacitance testers	17
B	191	B4-7 Do you use capacitor substitution boxes	5
B	192	B4-8 Do you use DC restorers (CRT rejuvinators)	4
B	193	B4-9 Do you use logic current tracers	6
B	194	B4-10 Do you use tube testers	13
B	195	B4-11 Do you use logic pulsers	6
B	196	B4-12 Do you use logic analyzers	8
B	197	B4-13 Do you use signature analyzers	4
B	198	B4-14 Do you use reflectometers	4

0013 III. Amplifier Circuits

0014 III 1. C1 Transistor Amplifier Circuits

C	199	C1-1 Do you trace block diagrams of circuits containing transistor amplifiers	69
C	200	C1-2 Do you trace schematic diagrams of transistor amplifier circuits	69
C	201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier	68
C	202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components	64
C	203	C1-5 Do you troubleshoot transistor amplifier distortion	36
C	204	C1-6 Do you adjust or align transistor amplifiers	38
C	205	C1-7 Do you measure transistor amplifier voltage, current, or power gain	47
C	206	C1-8 Do you calculate values of transistor amplifier voltage, current or power gain	25
C	207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	11
C	208	C1-10 Do you work on cascade-connected transistor amplifiers	23
C	209	C1-11 Do you work on paraphase transistor amplifiers	11
C	210	C1-12 Do you work on push-pull transistor amplifiers	50
C	211	C1-13 Do you work on audio transistor amplifiers	50
C	212	C1-14 Do you work on wideband transistor amplifiers	28
C	213	C1-15 Do you work on IF transistor amplifiers	12
C	214	C1-16 Do you work on RF transistor amplifiers	17
C	215	C1-17 Do you work on buffer transistor amplifiers	44
C	216	C1-18 Do you work on complementary symmetry transistor amplifiers	8
C	217	C1-19 Do you work on DC transistor amplifiers (switching applications)	42

D T Y	Tsk Nbr	Task Title	306 50
0015		III 2. C2 Transistor Amplifier Stabilization Circuits	
C 218		C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	34
C 219		C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	33
C 220		C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	26
C 221		C2-4 Do you perform tasks on self-bias stabilization amplifiers	25
C 222		C2-5 Do you perform tasks on thermistor stabilization amplifiers	26
C 223		C2-6 Do you perform tasks on diode stabilization amplifiers	33
C 224		C2-7 Do you perform tasks on double diode stabilization amplifiers	14
0016		III 3. C3 Coupling Circuits	
C 225		C3-1 Do you trace block diagrams of circuits containing coupling circuits	46
C 226		C3-2 Do you trace schematic diagrams of coupling circuits	46
C 227		C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	44
C 228		C3-4 Do you troubleshoot coupling circuits to circuit level components	40
C 229		C3-5 Do you perform tasks on direct coupling circuits	43
C 230		C3-6 Do you perform tasks on capacitive-resistive coupling circuits	37
C 231		C3-7 Do you perform tasks on capacitive-inductive coupling circuits	33
C 232		C3-8 Do you perform tasks on transformer coupling circuits	38
C 233		C3-9 Do you perform tasks on optical coupling circuits	9
0017		III 4. C4 Electron Tube Amplifier Circuits	
C 234		C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	17
C 235		C4-2 Do you trace schematic diagrams of electron tube amplifiers	18
C 236		C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	18

D T Y	Tsk Nbr	Task Title	306 50
C	237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	17
C	238	C4-5 Do you troubleshoot electron tube amplifier distortion	11
C	239	C4-6 Do you adjust or align electron tube amplifiers	12
C	240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	13
C	241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	7
C	242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	4
C	243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	11
C	244	C4-11 Do you perform tasks on audio electron tube amplifiers	6
C	245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	16
C	246	C4-13 Do you perform tasks on common grid electron tube amplifiers	15
C	247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	16
C	248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	13

0018 III 5. C5 Operational Amplifiers

C	249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	40
C	250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	40
C	251	C5-3 Do you calculate op amp gain	13
C	252	C5-4 Do you adjust op amp bias, offsets, or drift	21
C	253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	36
C	254	C5-6 Do you use or apply operational amplifiers as differential/comparators	18
C	255	C5-7 Do you use or apply operational amplifiers for summing	9
C	256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	20
C	257	C5-9 Do you use or apply operational amplifiers as active filters	19
C	258	C5-10 Do you use or apply operational amplifiers as oscillators	30
C	259	C5-11 Do you use or apply operational amplifiers as integrators	13
C	260	C5-12 Do you use or apply operational amplifiers for differentiators	13
C	261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	41

D T Y	Tsk Nbr	Task Title	306 50
C	262	C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	37
C	263	C5-15 Do you use or apply operational amplifiers as multivibrators	37
C	264	C5-16 Do you use or apply operational amplifiers as modulators/demodulators	33

0019 III 6. C6 Magnetic Amplifiers

C	265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	4
C	266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	4
C	267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	3
C	268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	3
C	269	C6-5 Do you adjust magnetic amplifiers or components	2
C	270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	3
C	271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	3
C	272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	3
C	273	C6-9 Do you troubleshoot saturable reactors to circuit level components	3
C	274	C6-10 Do you adjust saturable reactor circuits or components	2

0020 IV. Power Supplies

0021 IV 1. D1 Power Supply Circuits

D	275	D1-1 Do you trace block diagrams of circuits containing power supplies	86
D	276	D1-2 Do you trace schematic diagrams of power supply circuits	85
D	277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	88
D	278	D1-4 Do you troubleshoot power supplies to circuit level components	81
D	279	D1-5 Do you align or adjust power supplies	87
D	280	D1-6 Do you perform tasks on half-wave rectifier power supplies	67

D T Y	Tsk Nbr	Task Title	306 50
D	281	D1-7 Do you perform tasks on full-wave rectifier power supplies	72
D	282	D1-8 Do you perform tasks on full-wave bridge rectifier power supplies	74
D	283	D1-9 Do you perform tasks on three-phase rectifier power supplies	23
D	284	D1-10 Do you perform tasks on voltage multipliers (doublers/triplers)	40
D	285	D1-11 Do you perform tasks on DC to DC converters	60
D	286	D1-12 Do you perform tasks on inverters (DC to AC converters)	46
D	287	D1-13 Do you perform tasks on switching power supplies	16

0022 IV 2. D2 Power Supply Filters

D	288	D2-1 Do you trace block diagrams of circuits containing power supply filters	68
D	289	D2-2 Do you trace schematic diagrams of power supply filters	67
D	290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	66
D	291	D2-4 Do you troubleshoot power supply filters to circuit level components	58
D	292	D2-5 Do you perform tasks on capacitive power supply filters	60
D	293	D2-6 Do you perform tasks on inductive power supply filters	52
D	294	D2-7 Do you perform tasks on L-type power supply filters	34
D	295	D2-8 Do you perform tasks on Pi-type power supply filters	29
D	296	D2-9 Do you perform tasks on T-type power supply filters	26
D	297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	59
D	298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	54

0023 IV 3. D3 Power Supply Voltage Regulators

D	299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	70
D	300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	69
D	301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	68
D	302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	65
D	303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	64

D T Y	Tsk Nbr	Task Title	306 50
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	62
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	53
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators	31
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	20
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	29
D	309	D3-11 Do you perform tasks on crow bar power supply voltage regulators	10

0024 V. Reactive Circuits

0025 V 1. E1 Resistive Capacitive Inductive Circuits

E	310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	35
E	311	E1-2 Do you troubleshoot RCL circuits to circuit level components	33
E	312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	31
E	313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	31
E	314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits	13
E	315	E1-6 Do you calculate phase angle of RCL circuits	9
E	316	E1-7 Do you calculate values of power in RCL circuits	10

0026 V 2. E2 Frequency Sensitive Filters

E	317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters	30
E	318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter	30
E	319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components	28
E	320	E2-4 Do you align or adjust frequency sensitive filters	23
E	321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	11
E	322	E2-6 Do you perform tasks on low pass frequency sensitive filters	31

D T Y	Tsk Nbr	Task Title	306 50
E	323	E2-7 Do you perform tasks on high pass frequency sensitive filters	31
E	324	E2-8 Do you perform tasks on band pass frequency sensitive filters	31
E	325	E2-9 Do you perform tasks on band-reject frequency sensitive filters	22
E	326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters	4

0027 VI. Waveshaping/Generating Circuits

0028 VI 1. F1 Oscillators

F	327	F1-1 Do you trace block diagrams of circuits containing oscillators	67
F	328	F1-2 Do you trace schematic diagrams of oscillator circuits	66
F	329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit	65
F	330	F1-4 Do you troubleshoot oscillators to circuit level components	59
F	331	F1-5 Do you align or adjust oscillator circuits	62
F	332	F1-6 Do the oscillators you work with use LC tank circuits	42
F	333	F1-7 Do the oscillators you work with use RC networks	40
F	334	F1-8 Do the oscillators you work with use crystals	65
F	335	F1-9 Do the oscillators you work with use phase lock loops (PLL)	17
F	336	F1-10 Do you perform tasks on series Hartley oscillator circuits	29
F	337	F1-11 Do you perform tasks on shunt Hartley oscillator circuits	28
F	338	F1-12 Do you perform tasks on Colpitts oscillator circuits	26
F	339	F1-13 Do you perform tasks on Clapp oscillator circuits	11
F	340	F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	17
F	341	F1-15 Do you perform tasks on crystal oscillator circuits	60
F	342	F1-16 Do you perform tasks on Wien bridge oscillator circuits	7
F	343	F1-17 Do you perform tasks on pulse generating oscillator circuits	22
F	344	F1-18 Do you perform tasks on blocked/blocking oscillator circuits	6
F	345	F1-19 Do you perform tasks on burst generators	6
F	346	F1-20 Do you perform tasks on RC phase shift oscillators	16

D T Y	Tsk Nbr	Task Title	306 50
0029	VI 2.	F2 Multivibrators	
F	347	F2-1 Do you trace block diagrams of circuits containing multivibrators	64
F	348	F2-2 Do you trace schematic diagrams of multivibrator circuits	63
F	349	F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit	62
F	350	F2-4 Do you troubleshoot multivibrators to circuit level components	56
F	351	F2-5 Do you adjust or align multivibrator circuits	33
F	352	F2-6 Do the multivibrators you work with use LC tank circuits	40
F	353	F2-7 Do the multivibrators you work with use RC networks	43
F	354	F2-8 Do the multivibrators you work with use Crystals	45
F	355	F2-9 Do you perform tasks on astable (free running) multivibrators	58
F	356	F2-10 Do you perform tasks on monostable (one shot) multivibrators	63
F	357	F2-11 Do you perform tasks on bistable (flip flop) multivibrators	65
F	358	F2-12 Do you perform tasks on triggered astable multivibrators	46
0030	VI 3.	F3 Waveshaping Circuits	
F	359	F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	47
F	360	F3-2 Do you trace schematic diagrams of WSC	46
F	361	F3-3 Do you troubleshoot to isolate a faulty WSC	46
F	362	F3-4 Do you troubleshoot WSC to circuit level components	42
F	363	F3-5 Do you adjust or calibrate WSC	32
F	364	F3-6 Do you perform tasks on sawtooth wave generator WSC	39
F	365	F3-7 Do you perform tasks on trapazoidal (ramp) wave generator WSC	11
F	366	F3-8 Do you perform tasks on RC differentiating WSC	24
F	367	F3-9 Do you perform tasks on RL differentiating WSC	21
F	368	F3-10 Do you perform tasks on RC integrating WSC	21
F	369	F3-11 Do you perform tasks on RL integrating WSC	20
F	370	F3-12 Do you perform tasks on square wave generator WSC	44
F	371	F3-13 Do you perform tasks on rectangular wave generator WSC	22
F	372	F3-14 Do you perform tasks on Schmitt trigger WSC	46

D T Y	Tsk Nbr	Task Title	306 50
0031		VI 4. F4 Limiter/Clamper Circuits	
F 373		F4-1 Do you trace block diagrams of circuits containing limiters	44
F 374		F4-2 Do you trace schematic diagrams of limiter circuits	43
F 375		F4-3 Do you trace block diagrams of circuits containing clampers	39
F 376		F4-4 Do you trace schematic diagrams of clamper circuits	37
F 377		F4-5 Do you troubleshoot to isolate a faulty limiter circuit	40
F 378		F4-6 Do you troubleshoot limiters to circuit level components	37
F 379		F4-7 Do you troubleshoot to isolate a faulty clamper circuit	35
F 380		F4-8 Do you troubleshoot clampers to circuit level components	33
F 381		F4-9 Do you perform tasks on series diode limiter circuits	38
F 382		F4-10 Do you perform tasks on shunt diode limiter circuits	36
F 383		F4-11 Do you perform tasks on bias limiter circuits	22
F 384		F4-12 Do you perform tasks on zener diode circuits	41
F 385		F4-13 Do you perform tasks on transistor limiter circuits	30
F 386		F4-14 Do you perform tasks on triode limiter circuits	12
F 387		F4-15 Do you perform tasks on diode clamper circuits	35
F 388		F4-16 Do you perform tasks on bias clamper circuits	22
0032		VII. Computers, Digital Circuits, and Devices	
0033		VII 1. G1 Digital Logic Numbering Systems and Functions	
G 389		G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal	22
G 390		G1-2 Do you convert octal numbers to binary or binary numbers to octal	12
G 391		G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	19
G 392		G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	10
G 393		G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	19
G 394		G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	11
G 395		G1-7 Do you convert base number fractions to another base numbering system	9
G 396		G1-8 Do you add binary numbers	20

D T Y	Tsk Nbr	Task Title	306 50
G	397	G1-9 Do you subtract binary numbers	18
G	398	G1-10 Do you multiply binary numbers	12
G	399	G1-11 Do you divide binary numbers	11
G	400	G1-12 Do you add octal numbers	9
G	401	G1-13 Do you subtract octal numbers	9
G	402	G1-14 Do you add hexadecimal numbers	14
G	403	G1-15 Do you subtract hexadecimal numbers	13
G	404	G1-16 Do you use binary coded decimal (BCD)	14
G	405	G1-17 Do you use gray codes	2
G	406	G1-18 Do you use ICAO codes	1
G	407	G1-19 Do you use excess-3 (XS3) codes	1
G	408	G1-20 Do you use parity bit codes	12
G	409	G1-21 Do you use biquinary codes	2
G	410	G1-22 Do you use ASCII codes	20
G	411	G1-23 Do you use EBCDI codes	3
G	412	G1-24 Do you trace data flow through logic symbol diagrams	57
G	413	G1-25 Do you trace data flow through logic schematic diagrams	57
G	414	G1-26 Do you troubleshoot digital systems to major units	55
G	415	G1-27 Do you troubleshoot digital systems subassemblies or circuit cards	57
G	416	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC	48
G	417	G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)	49
G	418	G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)	44
G	419	G1-31 Do you perform tasks related to AND gates	63
G	420	G1-32 Do you perform tasks related to OR gates	63
G	421	G1-33 Do you perform tasks related to inhibited gates logic functions	47
G	422	G1-34 Do you perform tasks related to NAND or NOR gates	62
G	423	G1-35 Do you perform tasks related to exclusive OR/NOR logic functions	60
G	424	G1-36 Do you perform tasks related to RS flip flops	34
G	425	G1-37 Do you perform tasks related to D(Data) flip flops	43
G	426	G1-38 Do you perform tasks related to T(Toggle) flip flops	40
G	427	G1-39 Do you perform tasks related to JK flip flops	27
G	428	G1-40 Do you perform tasks related to Schmidt triggers	51
G	429	G1-41 Do you perform tasks related to delay (One-shot) logic functions	51
G	430	G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")	31
G	431	G1-43 Do you perform tasks related to buffers	46
G	432	G1-44 Do you perform tasks related to inverters	53
G	433	G1-45 Do you perform tasks related to complemented flip flops	26
G	434	G1-46 Do you perform tasks related to complementing flip flops	26

D T Tsk Y Nbr	Task Title	306 50
G 435	G1-47 Do you develop Boolean equations from logic circuits or diagrams	17
G 436	G1-48 Do you develop logic diagrams from Boolean equations	17
G 437	G1-49 Do you simplify Boolean expressions using Boolean algebra	18
G 438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)	16
G 439	G1-51 Do you perform tasks on DTL (diode transistor logic)	21
G 440	G1-52 Do you perform tasks on TTL (transistor transistor logic)	26
G 441	G1-53 Do you perform tasks on ECL/CML (emitter coupled or current mode logic)	7
G 442	G1-54 Do you perform tasks on HTL (high threshold logic)	6
G 443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)	21
G 444	G1-56 Do you perform tasks on positive MOS ICs	10
G 445	G1-57 Do you perform tasks on negative MOS ICs	9
G 446	G1-58 Do you perform tasks on vertical MOS ICs	6

0034 VII 2. G2 Computers

G 447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems	13
G 448	G2-2 Do you load programs	16
G 449	G2-3 Do you write or debug programs	6
G 450	G2-4 Do you troubleshoot computers to a major unit	14
G 451	G2-5 Do you troubleshoot computers to a subassembly or circuit card	14
G 452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC	6
G 453	G2-7 Do you use computer flow charts or diagrams	11
G 454	G2-8 Do you perform tasks on analog computers	7
G 455	G2-9 Do you perform tasks on digital computers	18
G 456	G2-10 Do you use Basic computer language	9
G 457	G2-11 Do you use COBOL computer language	2
G 458	G2-12 Do you use FORTRAN computer language	0
G 459	G2-13 Do you use ADA computer language	1
G 460	G2-14 Do you use ATLAS computer language	0
G 461	G2-15 Do you use ELAN computer language	0
G 462	G2-16 Do you use PASCAL computer language	1
G 463	G2-17 Do you use RPG computer language	0
G 464	G2-18 Do you use Machine computer language	5
G 465	G2-19 Do you use C computer language	0
G 466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories	15
G 467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories	14

D T Y	Tsk Nbr	Task Title	306 50
G	468	G2-22 Do you perform tasks on paper (tape, punch card) computer memories	2
G	469	G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories	2
G	470	G2-24 Do you perform tasks on computer keyboards	17
G	471	G2-25 Do you perform tasks on computer character printers	11
G	472	G2-26 Do you perform tasks on magnetic tape drives	9
G	473	G2-27 Do you perform tasks on microprocessor computer terminals	9
G	474	G2-28 Do you perform tasks on video display unit (VDU/ monitors)	11
G	475	G2-29 Do you perform tasks on paper tape readers/punches	4
G	476	G2-30 Do you perform tasks on paper card readers/punches	1
G	477	G2-31 Do you perform tasks on toggle or push button switch inputs	8
G	478	G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	7
G	479	G2-33 Do you perform tasks on modems	26
G	480	G2-34 Do you perform tasks on line printers	9
G	481	G2-35 Do you perform tasks on floppy disc drives	9
G	482	G2-36 Do you perform tasks on removable cartridge disc drives	4
G	483	G2-37 Do you perform tasks on removable pack disc drives	3
G	484	G2-38 Do you perform tasks on fixed winchester type disc drives	3
G	485	G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	9
G	486	G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	10
G	487	G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	6

0035 VII 3. G3 Digital Circuits

G	488	G3-1 Do you trace data flow through circuits containing counters	54
G	489	G3-2 Do you troubleshoot counter circuits to isolate a faulty counter	53
G	490	G3-3 Do you troubleshoot counters to circuit level components	50
G	491	G3-4 Do you perform tasks on UP counters in logic circuits	43
G	492	G3-5 Do you perform tasks on DOWN counters in logic circuits	41
G	493	G3-6 Do you perform tasks on DECADE counters in logic circuits	24
G	494	G3-7 Do you perform tasks on ring counters in logic circuits	26

D T Y	Tsk Nbr	Task Title	306 50
G	495	G3-8 Do you perform tasks on modulous counters in logic circuits	20
G	496	G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits	47
G	497	G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits	46
G	498	G3-11 Do you trace logic diagrams of circuits containing registers	49
G	499	G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register	47
G	500	G3-13 Do you troubleshoot registers to circuit level components	43
G	501	G3-14 Do you perform tasks on shift registers in logic circuits	50
G	502	G3-15 Do you perform tasks on storage registers in logic circuits	43
G	503	G3-16 Do you trace data flow through combinational logic circuits	39
G	504	G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit	38
G	505	G3-18 Do you troubleshoot combinational logic circuits to circuit level components	34
G	506	G3-19 Do you perform tasks on encoders	42
G	507	G3-20 Do you perform tasks on decoders	42
G	508	G3-21 Do you perform tasks on multiplexers	31
G	509	G3-22 Do you perform tasks on demultiplexers	24
G	510	G3-23 Do you perform tasks on comparators	32
G	511	G3-24 Do you perform tasks on parity generators or checkers	20
G	512	G3-25 Do you perform tasks on code converters	17
G	513	G3-26 Do you perform tasks on adders	38
G	514	G3-27 Do you perform tasks on subtractors	19
G	515	G3-28 Do you perform tasks on count detect circuits	16

0036 VII 4. G4 Digital to Analog (D/A) and Analog to Digital (A/ Converters

G	516	G4-1 Do you trace data flow through A/D converters	41
G	517	G4-2 Do you trace data flow through D/A converters	41
G	518	G4-3 Do you troubleshoot A/D converter circuits	36
G	519	G4-4 Do you troubleshoot D/A converter circuits	36
G	520	G4-5 Do the converters you perform tasks on use flash conversion	3
G	521	G4-6 Do the converters you perform tasks on use successive approximation conversion	8
G	522	G4-7 Do the converters you perform tasks on use ramp conversion	3
G	523	G4-8 Do the converters you perform tasks on use R2R conversion	3

D T Y	Tsk Nbr	Task Title	306 50
0037		VIII. Transmission/Reception Circuits, Devices, and Systems	
0038		VIII 1. H1 Connections	
H	524	H1-1 Do you measure electrical length on transmission lines	6
H	525	H1-2 Do you measure physical length on transmission lines	8
H	526	H1-3 Do you measure standing wave ratio (SWR) on transmission lines	5
H	527	H1-4 Do you construct transmission lines	9
H	528	H1-5 Do you match transmission line impedance with loads	17
H	529	H1-6 Do you calculate the characteristic impedance (ZO) of transmission lines	6
H	530	H1-7 Do you troubleshoot transmission lines	25
H	531	H1-8 Do you perform tasks on open-wire transmission lines	13
H	532	H1-9 Do you perform tasks on twisted pair transmission lines	26
H	533	H1-10 Do you perform tasks on twin lead transmission lines	15
H	534	H1-11 Do you perform tasks on flexible coaxial transmission lines	14
H	535	H1-12 Do you perform tasks on rigid coaxial transmission lines	8
H	536	H1-13 Do you perform tasks on fiber-optic transmission lines	9
H	537	H1-14 Do you trace schematic or block diagrams of circuits containing waveguides	1
H	538	H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly	1
H	539	H1-16 Do you pressurize or purge waveguide assemblies	1
H	540	H1-17 Do you measure standing wave ratio for waveguide assemblies	1
H	541	H1-18 Do you remove or install waveguide or associated coupling hardware components	1
0039		VIII 2. H2 Microwave Oscillators and Amplifiers	
H	542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	1
H	543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	1
H	544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	0
H	545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	0

D T Y	Tsk Nbr	Task Title	306 50
H	546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	0
H	547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	0
H	548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	0
H	549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	0
H	550	H2-9 Do you perform tasks on backward wave oscillator	0
H	551	H2-10 Do you perform tasks on parametric amplifiers	0
H	552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tunad microwave oscillators and amplifiers	0
	0040	VIII 3. H3 Resonant Cavities	
H	553	H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	1
H	554	H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	1
H	555	H3-3 Do you tune or adjust resonant cavities electrically	1
H	556	H3-4 Do you tune or adjust resonant cavities physically	1
H	557	H3-5 Do you measure frequency of resonant cavities	1
H	558	H3-6 Do you perform tasks on probe resonant cavities	0
H	559	H3-7 Do you perform tasks on loop resonant cavities	0
H	560	H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	0
	0041	VIII 4. H4 Transmitters and Receivers	
H	561	H4-1 Do you use "AM" modulation principles	3
H	562	H4-2 Do you trace block diagrams of AM transmitters	3
H	563	H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	3
H	564	H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuits cards	3
H	565	H4-5 Do you troubleshoot AM transmitters to major units	3
H	566	H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	3
H	567	H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	2
H	568	H4-8 Do you align or adjust AM transmitters or circuits	3
H	569	H4-9 Do you calculate percentage of modulation for AM transmitters	1
H	570	H4-10 Do you use "AM" demodulation principles	2
H	571	H4-11 Do you trace block diagrams of AM receivers	2

D T Y	Tsk Nbr	Task Title	306 50
H	572	H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	2
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	2
H	574	H4-14 Do you troubleshoot AM receivers to major units	2
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	2
H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	1
H	577	H4-17 Do you align or adjust AM receivers or circuits	2
H	578	H4-18 Do you trace block diagrams of single side band (SSB) transmitters	2
H	579	H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	1
H	580	H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	1
H	581	H4-21 Do you troubleshoot SSB transmitters to major units	2
H	582	H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	1
H	583	H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	1
H	584	H4-24 Do you align or adjust SSB transmitters or circuits	1
H	585	H4-25 Do you calculate percentage of modulation for SSB transmitters	0
H	586	H4-26 Do you trace block diagrams of SSB receivers	2
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	1
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	1
H	589	H4-29 Do you troubleshoot SSB receivers to major units	2
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards	1
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	1
H	592	H4-32 Do you align or adjust SSB receivers or circuits	1
H	593	H4-33 Do you use "FM" modulation principles	4
H	594	H4-34 Do you trace block diagrams of FM transmitters	4
H	595	H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards	3
H	596	H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	3
H	597	H4-37 Do you troubleshoot FM transmitters to major units	3
H	598	H4-38 Do you troubleshoot FM transmitters to sub-assemblies or circuit cards	3
H	599	H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards or circuit level components	2
H	600	H4-40 Do you align or adjust FM transmitters or circuits	3
H	601	H4-41 Do you calculate modulation index for FM transmitters	1
H	602	H4-42 Do you measure frequency deviation for FM transmitters	2
H	603	H4-43 Do you use "FM" demodulation principles	3

D T Y	Tsk Nbr	Task Title	306 50
H	604	H4-44 Do you trace block diagrams of FM receivers	3
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	2
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	2
H	607	H4-47 Do you troubleshoot FM receivers to major units	2
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	2
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	1
H	610	H4-50 Do you align or adjust FM receivers or circuits	2
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	0
H	612	H4-52 Do you use "PM" modulation principles	2
H	613	H4-53 Do you trace block diagrams of PM transmitters	2
H	614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	2
H	615	H4-55 Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards	2
H	616	H4-56 Do you troubleshoot PM transmitters to major units	2
H	617	H4-57 Do you troubleshoot PM transmitters to subassemblies or circuit cards	2
H	618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	2
H	619	H4-59 Do you align or adjust PM transmitters or circuits	2
H	620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	0
H	621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	1
H	622	H4-62 Do you use "PM" demodulation principles	2
H	623	H4-63 Do you trace block diagrams of PM receivers	2
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	2
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	2
H	626	H4-66 Do you troubleshoot PM receivers to major units	2
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	2
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	1
H	629	H4-69 Do you align or adjust PM receivers or circuits	2

0042 VIII 5. H5 Antennas

H	630	H5-1 Do you physically align antennas	6
H	631	H5-2 Do you electrically align antennas	3
H	632	H5-3 Do you troubleshoot loading of antennas	2
H	633	H5-4 Do you troubleshoot coupling of antennas	3

D T Y	Tsk Nbr	Task Title	306 50
H	634	H5-5 Do you plot graph radiation patterns	1
H	635	H5-6 Do you troubleshoot antenna components	3
H	636	H5-7 Do you measure standing wave ratio (SWR) for antennas	1
H	637	H5-8 Do you work with Yagi antennas	1
H	638	H5-9 Do you work with dipole antennas	3
H	639	H5-10 Do you work with slotted antennas	1
H	640	H5-11 Do you work with rotary antennas	2
H	641	H5-12 Do you work with hertz antennas	0
H	642	H5-13 Do you work with marconi antennas	0
H	643	H5-14 Do you work with rhombic antennas	0
H	644	H5-15 Do you work with scimitar antennas	0
H	645	H5-16 Do you work with parabolic antennas	1
H	646	H5-17 Do you work with ground plane antennas	1
H	647	H5-18 Do you perform tasks on rotary antenna arrays	1
H	648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	0
H	649	H5-20 Do you perform tasks on broadside antenna arrays	1
H	650	H5-21 Do you perform tasks on cardioid antenna arrays	1
H	651	H5-22 Do you perform tasks on collinear antenna arrays	0
H	652	H5-23 Do you perform tasks on phase antenna arrays	1
H	653	H5-24 Do you perform tasks on planar antenna arrays	0
H	654	H5-25 Do you perform tasks on antennas with vertical polarization	2
H	655	H5-26 Do you perform tasks on antennas with horizontal polarization	2
H	656	H5-27 Do you perform tasks on antennas with circular polarization	1
H	657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	3
H	658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	3
H	659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	3

0043 IX. Radio Frequency (RF) Measurements or Calculations

0044 IX 1. I1 RF Measurements

I	660	I1-1 Do you measure RF power	3
I	661	I1-2 Do you measure RF peak power	2
I	662	I1-3 Do you measure RF average power	2
I	663	I1-4 Do you measure RF effective power	1
I	664	I1-5 Do you measure RF output power using wattmeters	2

D T Tsk Y Nbr	Task Title	306 50
0045	IX 2. I2 RF Calculations	
I 665	I2-1 Do you calculate RF apparent power	1
I 666	I2-2 Do you calculate RF true power	1
I 667	I2-3 Do you calculate RF power loss or gain in db	3
0046	X. Additional Circuits, Devices, Systems, or Items	
0047	X 1. J1 Microphones and Speakers	
J 668	J1-1 Do you trace block diagrams of circuits containing microphones	19
J 669	J1-2 Do you trace schematic diagrams of microphone circuits	18
J 670	J1-3 Do you troubleshoot to isolate a faulty microphone	21
J 671	J1-4 Do you troubleshoot microphones	11
J 672	J1-5 Do you work on carbon microphones	17
J 673	J1-6 Do you work on capacitor microphones	4
J 674	J1-7 Do you work on crystal microphones	5
J 675	J1-8 Do you work on dynamic microphones	12
J 676	J1-9 Do you work on velocity ribbon microphones	3
J 677	J1-10 Do you trace block diagrams of circuits containing speakers	20
J 678	J1-11 Do you trace schematic diagrams of speaker circuits	18
J 679	J1-12 Do you troubleshoot to isolate a faulty speaker	19
J 680	J1-13 Do you troubleshoot speakers	10
0048	X 2. J2 Photosensitive Devices	
J 681	J2-1 Do you trace block diagrams of circuits containing photosensitive devices	3
J 682	J2-2 Do you trace schematic diagrams of photosensitive device circuits	3
J 683	J2-3 Do you troubleshoot to isolate a faulty photo-sensitive device	3
J 684	J2-4 Do you adjust or calibrate photosensitive devices	1
J 685	J2-5 Do you work on photodiodes	3
J 686	J2-6 Do you work on phototransistors	2
J 687	J2-7 Do you work on phototubes	0
J 688	J2-8 Do you work on photo-SCRs	0

D T Y	Tsk Nbr	Task Title	306 50
J	689	J2-9 Do you work on photocells (Photoconductive or Photovoltaic)	1
0049		X 3. J3 Storage Type Display Tubes	
J	690	J3-1 Do you trace block diagrams of circuits containing display tubes	0
J	691	J3-2 Do you trace schematic diagrams of display tubes or circuits	0
J	692	J3-3 Do you troubleshoot to isolate a faulty display tube	0
J	693	J3-4 Do you adjust or calibrate display tubes or circuits	0
J	694	J3-5 Do you work on direct view storage tubes (DVST)	0
J	695	J3-6 Do you work on multiple mode storage tubes (MMST)	0
J	696	J3-7 Do you work on scan converter tubes (SCT)	0
0050		X 4. J4 Television, Laser, and Infrared Systems	
J	697	J4-1 Do you trace block diagrams of TV systems or subassemblies	0
J	698	J4-2 Do you trace schematic diagrams of TV systems or component circuits	0
J	699	J4-3 Do you troubleshoot TV systems to major subassemblies	0
J	700	J4-4 Do you troubleshoot TV systems to circuit level components	0
J	701	J4-5 Do you adjust or calibrate TV systems or components	0
J	702	J4-6 Do you trace block diagrams of laser systems or subassemblies	0
J	703	J4-7 Do you trace schematic diagrams of laser systems or component circuits	0
J	704	J4-8 Do you troubleshoot laser systems to major subassemblies	0
J	705	J4-9 Do you troubleshoot laser systems to circuit level components	0
J	706	J4-10 Do you adjust or calibrate laser systems or components	0
J	707	J4-11 Do you trace block diagrams of infrared systems or subassemblies	1
J	708	J4-12 Do you trace schematic diagrams of infrared systems or component circuits	0
J	709	J4-13 Do you troubleshoot infrared systems to major subassemblies	0
J	710	J4-14 Do you troubleshoot infrared systems circuit level components	0

D T Tsk Y Nbr	Task Title	306 50
J 711	J4-15 Do you inspect, clean, or service infrared systems or components	1
J 712	J4-16 Do you adjust or calibrate infrared systems or components	0

0051 Tasks not referenced

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Module Statement						

Description of Reported Task Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Task Statement						
2	F0083	GP0089/PMP	All DAFSC 30650	235	24.48	25.37	97.45	.00	712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in Electronic Fundamentals/Applicatons order. Data for this report was collected from job incumbents during the period September 1987 - April 1988

Percent members responding "YES" is shown for each specialty listed.

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6811.

D T Y	Tsk Nbr	Task Title	306 50
0001		STS 1 Electronic Fundamentals/ Applications dated 20 Feb 1987	
0002		1. Basic Terms	
0003		1a. Metric Notation	B
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)	73
0004		1b. DC Terms	B
A	2	A1-2 Do you use basic DC electrical/electronic terms	97
0005		1c. AC Terms	B
A	3	A1-3 Do you use basic AC electrical/electronic terms	95
0006		2. Basic Circuits	

D T Y	Tsk Nbr	Task Title		306 50
0007		2a. Theory of operation	B	
A	4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries		93
0008		2b. Troubleshoot circuits	2b	
A	5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries		94
0009		3. Basic Circuit Calculations		
0010		3a. DC	B	
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power		45
A	12	A1-12 Do you calculate the value of a resistor required for a circuit		48
0011		3b. AC	B	
A	7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage		45
A	8	A1-8 Do you calculate values of frequency, phase relationship, or wave length		46
0012		4. Resistors		
0013		4a. Theory of operation	B	
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors		89

D T Y	Tsk Nbr	Task Title		306 50
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors		83
0014		4b. Isolate faulty resistors	2b	
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor		84
A	14	A1-14 Do you ohm check resistors		83
0015		4c. Color code	B	
A	13	A1-13 Do you determine ohmic value of a resistor using the color code		75
0016		5. Relays/Solenoids		
0017		5a. Relay theory of operation	B	
A	15	A1-15 Do you trace schematic or block diagrams of circuits containing relays		79
A	17	A1-17 Do you adjust relays		41
A	18	A1-18 Do you perform tasks on contacts, cores, coils, armatures, or springs		43
0018		5b. Isolate faulty relays	2b	
A	16	A1-16 Do you troubleshoot circuits to isolate a faulty relay		78
A	19	A1-19 Do you continuity check relays		58
0019		5c. Solenoid theory of operation	-	
A	77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids		7
A	79	A2-35 Do you perform maintenance on solenoid component parts		4

D T Y	Tsk Nbr	Task Title		306 50
0020		5d. Isolate faulty solenoids	-	
A	78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid		7
0021		6. Inductors		
0022		6a. Theory of operation	B	
A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils		67
A	25	A1-25 Do you calibrate or adjust circuits by using variable inductors		43
0023		6b. Isolate faulty inductors	2b	
A	21	A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil		65
A	26	A1-26 Do you ohm check inductors		57
0024		6c. Calculations	B	
A	22	A1-22 Do you calculate values of circuit total inductance		23
A	23	A1-23 Do you calculate values of circuit or component inductive reactance		21
A	24	A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors		26
0025		7. Capacitors		

D T Y	Tsk Nbr	Task Title		306 50
0026		7a. Theory of operation	B	
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors		85
A	32	A1-32 Do you calibrate or adjust circuits using variable capacitors		43
0027		7b. Isolate faulty capacitors	2b	
A	28	A1-28 Do you troubleshoot circuits to isolate a faulty capacitor		83
A	33	A1-33 Do you ohm check capacitors		78
0028		7c. Calculations	-	
A	29	A1-29 Do you calculate values of circuit total capacitance		31
A	30	A1-30 Do you calculate values of circuit or component capacitive reactance		27
A	31	A1-31 Do you calculate values of circuit or component voltage or current in circuits containing capacitors		31
0029		7d. Color code	B	
A	34	A1-34 Do you use capacitor color codes in your present job		23
0030		8. Transformers		
0031		8a. Theory of operation	B	
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers		80
A	39	A1-39 Do you calibrate or adjust circuits using variable transformers		25

D T Y	Tsk Nbr	Task Title		306 50
0032		8b. Isolate faulty transformers	2b	
A	36	A1-36 Do you troubleshoot circuits to isolate a faulty transformer		77
A	40	A1-40 Do you ohm check transformers		65
A	41	A1-41 Do you measure transformer output voltage		73
0033		8c. Calculations	-	
A	37	A1-37 Do you calculate transformer voltage or current step-up or step-down ratios		35
A	38	A1-38 Do you calculate impedance of transformers		22
0034		9. Three Phase Transformers		
0035		9a. Theory of operation	B	
A	42	A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers		29
A	44	A1-44 Do you adjust three phase transformers		17
0036		9b. Isolate faulty three phase transformers	-	
A	43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer		27
0037		10. DC Motors		
0038		10a. Theory of operation	B	
A	45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors		23

D T Y	Tsk Nbr	Task Title		306 50
A	48	A2-4 Do you perform tasks on DC motor component parts		14
0039		10b. Isolate faulty DC motors	2b	
A	46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor		23
0040		10c. Troubleshoot motors	2b	
A	47	A2-3 Do you troubleshoot DC motor component parts		13
0041		11. AC Motors		
0042		11a. Theory of operation	B	
A	49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors		23
A	52	A2-8 Do you perform tasks on AC motor component parts		14
0043		11b. Isolate faulty AC motors	2b	
A	50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor		22
0044		11c. Troubleshoot motors	2b	
A	51	A2-7 Do you troubleshoot AC motor component parts		11
0045		12. DC Generators		

D T Y	Tsk Nbr	Task Title	306 50
0046		12a. Theory of operation	-
A	53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	4
A	56	A2-12 Do you perform tasks on component parts of DC generators	4
0047		12b. Isolate faulty DC generators	-
A	54	A2-10 Do you troubleshoot to isolate a faulty DC generator	4
0048		12c. Troubleshoot DC generators	-
A	55	A2-11 Do you troubleshoot DC generator component parts	4
0049		13. AC Generators	
0050		13a. Theory of operation	-
A	57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	4
A	60	A2-16 Do you perform tasks on component parts of AC generators	3
0051		13b. Isolate faulty AC generators	-
A	58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	4
0052		13c. Troubleshoot AC generators	-
A	59	A2-15 Do you troubleshoot AC generator component parts	3

D T Y	Tsk Nbr	Task Title	306 50	
0053		14. Alternators		
0054		14a. Theory of operation	-	
A	61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators		2
A	64	A2-20 Do you perform tasks on component parts of alternators		1
0055		14b. Isolate faulty alternators	-	
A	62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator		1
0056		14c. Troubleshoot alternators	-	
A	63	A2-19 Do you troubleshoot alternator component parts		1
0057		15. Synchro/Servos		
0058		15a. Theory of operation	B	
A	65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos		7
A	68	A2-24 Do you perform tasks on component parts of synchros or servos		6
0059		15b. Isolate faulty synchro/servos	2b	
A	66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo		7

D T Y	Tsk Nbr	Task Title		306 50
0060		15c. Troubleshoot synchro/servos	2b	
A	67	A2-23 Do you troubleshoot synchro or servo component parts		6
0061		16. Choppers (Synchronous Vibrators)		
0062		16a. Theory of operation	B	
A	69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers		2
0063		16b. Isolate faulty choppers	2b	
A	70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper		2
A	71	A2-27 Do you measure chopper coil excitation frequency		1
A	72	A2-28 Do you measure chopper coil voltage-current phase relationship		1
0064		17. Transducers		
0065		17a. Theory of operation	B	
A	73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers		3
A	75	A2-31 Do you calibrate or adjust transducers		3
A	76	A2-32 Do you repair, clean or lubricate transducers		3
0066		17b. Isolate faulty transducers	2b	
A	74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer		4

D T Tsk Y Nbr	Task Title	306 50
0067	18. Meter Movements	
0068	18a. Theory of operation B	
A 80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	27
A 82	A2-38 Do you perform maintenance on meter movement mechanical parts	12
0069	18b. Isolate faulty meter movements 2b	
A 81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement	26
0070	19. Solid State Diodes	
0071	19a. Theory of operation B	
A 83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	81
0072	19b. Isolate faulty solid state diodes 2b	
A 84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	80
A 85	A3-3 Do you check diodes using an ohmmeter	78
0073	19c. Specifications B	
A 86	A3-4 Do you use diode characteristic curves	16
A 87	A3-5 Do you use diode substitution information	39

D T Y	Tsk Nbr	Task Title		306 50
0074		19d. Color code	B	
A	88	A3-6 Do you use diode color codes		30
0075		20. Bipolar Junction Transistors		
0076		20a. Theory of operation	B	
A	89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors		85
0077		20b. Isolate faulty transistors	2b	
A	90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor		84
A	91	A3-9 Do you check transistors using an ohmmeter		82
A	92	A3-10 Do you check transistors using transistor testers		50
0078		20c. Specifications	B	
A	93	A3-11 Do you use transistor characteristic curves		16
A	94	A3-12 Do you use transistor substitution information		40
0079		21. Integrated Circuits		
0080		21a. Familiarization	B	
A	95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)		74

D T Y	Tsk Nbr	Task Title		306 50
0081		21b. Isolate faulty integrated circuits	2b	
A	96	A3-14 Do you troubleshoot circuits to isolate a faulty IC		69
0082		21c. Specifications	B	
A	97	A3-15 Do you use IC substitutio.. information		36
0083		22. Solid State Special Purpose Devices (SCR, Zener Diode, Tunnel Diode, LED, LCD, UJT, JFET, MOSFET)		
0084		22a. Theory of operation	B	
A	98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices		54
A	100	A3-18 Do you perform tasks on varactors/varicaps		28
A	101	A3-19 Do you perform tasks on tunnel diodes		23
A	102	A3-20 Do you perform tasks on field effect transistors (FET)		36
A	103	A3-21 Do you perform tasks on unijunction transistors (UJT)		45
A	104	A3-22 Do you perform tasks on zener diodes		69
A	105	A3-23 Do you perform tasks on liquid crystal displays (LCD)		26
A	106	A3-24 Do you perform tasks on pin diodes		17
A	107	A3-25 Do you perform tasks on light emitting diodes (LED)		49
A	108	A3-26 Do you perform tasks on fantail transistors		12
A	109	A3-27 Do you perform tasks on silicon controlled rectifiers (SCR)		49
A	110	A3-28 Do you perform tasks on triacs		9
A	111	A3-29 Do you perform tasks on programmable unijunction transistors (PUT)		7
A	112	A3-30 Do you perform tasks on silicon controlled switches (SCS)		12
A	113	A3-31 Do you perform tasks on silicon unilateral switches (SUS)		6
A	114	A3-32 Do you perform tasks on step recovery diodes (SRD)		7
A	115	A3-33 Do you perform tasks on field effect diodes (FED)		14
A	116	A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode)		6
A	117	A3-35 Do you perform tasks on varistors		51
A	118	A3-36 Do you perform tasks on metal oxide varistors (MOV)		7

D T Y	Tsk Nbr	Task Title		306 50
A	119	A3-37 Do you perform tasks on schottky diodes		5
0085		22b. Isolate faulty special purpose devices	2b	
A	99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device		51
0086		23. Electron Tubes		
0087		23a. Theory of operation	B	
A	120	A4-1 Do you trace block diagrams of circuits containing electron tubes		32
A	121	A4-2 Do you trace schematic diagrams of electron tube circuits		31
A	125	A4-6 Do you perform tasks on diode tubes		21
A	126	A4-7 Do you perform tasks on triode tubes		23
A	127	A4-8 Do you perform tasks on tetrode tubes		22
A	128	A4-9 Do you perform tasks on pentode tubes		21
A	129	A4-10 Do you perform tasks on beam power tubes		3
A	130	A4-11 Do you perform tasks on gas tubes		13
A	131	A4-12 Do you perform tasks on phantastrons		2
A	132	A4-13 Do you perform tasks on neon tubes		6
A	133	A4-14 Do you perform tasks on xenon tubes		3
A	134	A4-15 Do you perform tasks on nixie tubes		3
0088		23b. Isolate faulty tubes	-	
A	122	A4-3 Do you troubleshoot circuits to isolate a faulty electron tube		31
0089		23c. Specifications	-	
A	123	A4-4 Do you use electron tube characteristic curves		8
A	124	A4-5 Do you use electron tube substitution manuals or charts		14

D T Y	Tsk Nbr	Task Title		306 50
0090		24. Cathode Ray Tubes (CRT)		
0091		24a. Theory of operation	B	
A 135		A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT)		6
A 136		A4-17 Do you trace schematic diagrams of CRT circuits		6
A 138		A4-19 Do you adjust or calibrate circuits that control CRT operations		6
A 139		A4-20 Do you perform tasks on electrostatic CRT		4
A 140		A4-21 Do you perform tasks on electromagnetic CRT		2
0092		24b. Isolate faulty CRTs	2b	
A 137		A4-18 Do you troubleshoot to isolate a faulty CRT		6
0093		25. Solder/Desolder		
0094		25a. Terminal connections	2b	
A 141		A5-1 Do you solder or desolder hardwire connections		96
A 142		A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc		88
0095		25b. P C Boards	2b	
A 143		A5-3 Do you solder or desolder printed circuit board connections		81
A 144		A5-4 Do you solder or desolder multi-layer circuit board connections		25
A 145		A5-5 Do you perform high reliability soldering		67

D T Y	Tsk Nbr	Task Title		306 50
0096		25c. Multipin connectors	2b	
A 149		A5-9 Do you repair or fabricate connectors or cables on multiconductor cables		70
A 152		A5-12 Do you repair or fabricate connectors or cables on ribbon cables		30
0097		25d. Coaxial connectors	-	
A 150		A5-10 Do you repair or fabricate connectors or cables on coaxial cables		72
A 151		A5-11 Do you repair or fabricate connectors or cables on triaxial cables		31
0098		26. Assemble Solderless Connectors		
0099		26a. Crimp	2b	
A 146		A5-6 Do you use crimping tool to repair or make connections		88
A 147		A5-7 Do you use wire wrap tool to make connections		71
A 148		A5-8 Do you use punch-on tool to make connections		62
0100		26b. Coaxial	2b	
A 150		A5-10 Do you repair or fabricate connectors or cables on coaxial cables		72
A 151		A5-11 Do you repair or fabricate connectors or cables on triaxial cables		31
0101		26c. Multipin	2b	
A 149		A5-9 Do you repair or fabricate connectors or cables on multiconductor cables		70
A 152		A5-12 Do you repair or fabricate connectors or cables on ribbon cables		30

D T Tsk Y Nbr	Task Title	306 50
0102	27. Use Test Equipment Usage	
0103	27a. Multimeter, analog 2b	
B 153	B1-1 Do you use the multimeter to measure DC voltage values	97
B 154	B1-2 Do you use the multimeter to measure AC voltage values	94
B 155	B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts	19
B 156	B1-4 Do you use the multimeter to measure DC current values	77
B 157	B1-5 Do you use the multimeter to measure AC current values	70
B 158	B1-6 Do you use the multimeter to extend the range of ammeters using external shunts	14
B 159	B1-7 Do you use the multimeter to measure circuit resistance	74
B 160	B1-8 Do you use the multimeter to measure component resistance	85
0104	27b. Oscilloscope 2b	
B 161	B2-1 Do you use the oscilloscope to measure time to determine frequency	74
B 162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	76
B 163	B2-3 Do you use the oscilloscope to measure AC voltage	86
B 164	B2-4 Do you use the oscilloscope to measure DC voltage	90
B 165	B2-5 Do you use the oscilloscope to measure ripple voltages	87
B 166	B2-6 Do you use the oscilloscope to measure phase jitters	42
B 167	B2-7 Do you use the oscilloscope to observe signal/data patterns	89
B 168	B2-8 Do you use the oscilloscope to observe lissajous patterns	62
B 169	B2-9 Do you use the oscilloscope to observe phase relationships	66
B 170	B2-10 Do you use attenuator probes with oscilloscopes	69
B 171	B2-11 Do you use delay time multipliers with oscilloscopes	25
0105	27c. Signal Generator 2b	
B 172	B3-1 Do you use signal generators (SG) to perform operational checks	60

D T Y	Tsk Nbr	Task Title		306 50
B	173	B3-2 Do you use SG to perform alignments, adjustments, or calibrations		60
B	174	B3-3 Do you use SG to troubleshoot circuits		58
0106		27d. Frequency counter	2b	
B	185	B4-1 Do you use frequency counters		83
0107		27e. Spectrum Analyzer	2b	
B	186	B4-2 Do you use spectrum analyzers		15
0108		27f. Field strength tester	-	
B	187	B4-3 Do you use field strength testers		3
0109		27g. Multimeter, digital	2b	
B	188	B4-4 Do you use digital multimeters		95
0110		27h. Digital logic probe	2b	
B	189	B4-5 Do you use digital logic probes		17
0111		27i. Capacitor tester	2b	
B	190	B4-6 Do you use capacitance testers		17
0112		27j. Capacitor substitution box	-	
B	191	B4-7 Do you use capacitor substitution boxes		5

D T Y	Tsk Nbr	Task Title		306 50
0113		27k. DC restorer	-	
B 192	B4-8	Do you use DC restorers (CRT rejuvinators)		4
0114		27l. Logic current tracer	-	
B 193	B4-9	Do you use logic current tracers		6
0115		27m. Tube tester	-	
B 194	B4-10	Do you use tube testers		13
0116		27n. Logic pulser	-	
B 195	B4-11	Do you use logic pulsers		6
0117		27o. Logic analyzer	2b	
B 196	B4-12	Do you use logic analyzers		8
0118		27p. Signature analyzer	-	
B 197	B4-13	Do you use signature analyzers		4
0119		27q. Reflectometer	2b	
B 198	B4-14	Do you use reflectometers		4
0120		28. Transistor Amplifier Circuits (Common Emitter, Common Collector, Common Base)		

D T Y	Tsk Nbr	Task Title	306 50	
0121		28a. Theory of operation		
0122		28a(1). Amplifier circuits	B	
C	199	C1-1 Do you trace block diagrams of circuits containing transistor amplifiers		69
C	200	C1-2 Do you trace schematic diagrams of transistor amplifier circuits		69
C	204	C1-6 Do you adjust or align transistor amplifiers		38
C	206	C1-8 Do you calculate values of transistor amplifier voltage, current or power gain		25
C	207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers		11
C	208	C1-10 Do you work on cascade-connected transistor amplifiers		23
C	209	C1-11 Do you work on paraphase transistor amplifiers		11
C	210	C1-12 Do you work on push-pull transistor amplifiers		50
C	211	C1-13 Do you work on audio transistor amplifiers		50
C	212	C1-14 Do you work on wideband transistor amplifiers		28
C	213	C1-15 Do you work on IF transistor amplifiers		12
C	214	C1-16 Do you work on RF transistor amplifiers		17
C	215	C1-17 Do you work on buffer transistor amplifiers		44
C	216	C1-18 Do you work on complementary symmetry transistor amplifiers		8
C	217	C1-19 Do you work on DC transistor amplifiers (switching applications)		42
0123		28a(2). Stabilization circuits	B	
C	218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits		34
C	220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers		26
C	221	C2-4 Do you perform tasks on self-bias stabilization amplifiers		25
C	222	C2-5 Do you perform tasks on thermistor stabilization amplifiers		26
C	223	C2-6 Do you perform tasks on diode stabilization amplifiers		33
C	224	C2-7 Do you perform tasks on double diode stabilization amplifiers		14

D T Y	Tsk Nbr	Task Title		306 50
0124		28a(3). Coupling circuits	B	
C	225	C3-1 Do you trace block diagrams of circuits containing coupling circuits		46
C	226	C3-2 Do you trace schematic diagrams of coupling circuits		46
C	229	C3-5 Do you perform tasks on direct coupling circuits		43
C	230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits		37
C	231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits		33
C	232	C3-8 Do you perform tasks on transformer coupling circuits		38
C	233	C3-9 Do you perform tasks on optical coupling circuits		9
0125		28b. Isolate faulty amplifier circuits	2b	
C	201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier		68
C	205	C1-7 Do you measure transistor amplifier voltage, current, or power gain		47
C	227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit		44
0126		28c. Troubleshoot circuits	2b	
C	202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components		64
C	203	C1-5 Do you troubleshoot transistor amplifier distortion		36
C	219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components		33
C	228	C3-4 Do you troubleshoot coupling circuits to circuit level components		40
0127		29. Electron Tube Amplifiers		

D T Y	Tsk Nbr	Task Title	306 50
0128		29a. Theory of operation -	
C 234	C4-1	Do you trace block diagrams of circuits containing electron tube amplifiers	17
C 235	C4-2	Do you trace schematic diagrams of electron tube amplifiers	18
C 239	C4-6	Do you adjust or align electron tube amplifiers	12
C 241	C4-8	Do you calculate values of electron tube amplifier voltage, current, or power gain	7
C 242	C4-9	Do you perform tasks on paraphase electron tube amplifiers	4
C 243	C4-10	Do you perform tasks on push-pull electron tube amplifiers	11
C 244	C4-11	Do you perform tasks on audio electron tube amplifiers	6
C 245	C4-12	Do you perform tasks on voltage regulator electron tube amplifiers	16
C 246	C4-13	Do you perform tasks on common grid electron tube amplifiers	15
C 247	C4-14	Do you perform tasks on common cathode electron tube amplifiers	16
C 248	C4-15	Do you perform tasks on cathode follower electron tube amplifiers	13
0129		29b. Isolate faulty tube amplifiers -	
C 236	C4-3	Do you troubleshoot to isolate a faulty electron tube amplifier	18
C 240	C4-7	Do you measure electron tube amplifier voltage, current, or power gain	13
0130		29c. Troubleshoot circuits -	
C 237	C4-4	Do you troubleshoot electron tube amplifiers to circuit level components	17
C 238	C4-5	Do you troubleshoot electron tube amplifier distortion	11
0131		30. Operational Amplifiers	

D T Y	Tsk Nbr	Task Title	306 50
0132		30a. Theory of operation B	
C 249		C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	40
C 251		C5-3 Do you calculate op amp gain	13
C 252		C5-4 Do you adjust op amp bias, offsets, or drift	21
C 253		C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	36
C 254		C5-6 Do you use or apply operational amplifiers as differential/comparators	18
C 255		C5-7 Do you use or apply operational amplifiers for summing	9
C 256		C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	20
C 257		C5-9 Do you use or apply operational amplifiers as active filters	19
C 258		C5-10 Do you use or apply operational amplifiers as oscillators	30
C 259		C5-11 Do you use or apply operational amplifiers as integrators	13
C 260		C5-12 Do you use or apply operational amplifiers for differentiators	13
C 261		C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	41
C 262		C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	37
C 263		C5-15 Do you use or apply operational amplifiers as multivibrators	37
C 264		C5-16 Do you use or apply operational amplifiers as modulators/demodulators	33
0133		30b. Isolate faulty Op Amps -	
C 250		C5-2 Do you troubleshoot to isolate a faulty op amp circuit	40
0134		31. Magnetic Amplifiers	

D T Tsk Y Nbr	Task Title	306 50
0135	31a. Theory of operation	-
C 265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	4
C 266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	4
C 269	C6-5 Do you adjust magnetic amplifiers or components	2
0136	31b. Isolate faulty magnetic amplifiers	-
C 267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	3
0137	31c. Troubleshoot circuits	-
C 268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	3
0138	32. Saturable Reactors	
0139	32a. Theory of operation	-
C 270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	3
C 271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	3
C 274	C6-10 Do you adjust saturable reactor circuits or components	2
0140	32b. Isolate faulty saturable reactors	-
C 272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	3

D T Y	Tsk Nbr	Task Title	306 50
0141		32c. Troubleshoot circuits	
C 273		C6-9 Do you troubleshoot saturable reactors to circuit level components	3
0142		33. Power Supply Circuits (Half-wave, Full-wave, Full-wave bridge)	
0143		33a. Theory of operation	
0144		33a(1). Rectifiers (Half-wave, Full-wave, Full-wave bridge)	B
D 275		D1-1 Do you trace block diagrams of circuits containing power supplies	86
D 276		D1-2 Do you trace schematic diagrams of power supply circuits	85
D 279		D1-5 Do you align or adjust power supplies	87
D 280		D1-6 Do you perform tasks on half-wave rectifier power supplies	67
D 281		D1-7 Do you perform tasks on full-wave rectifier power supplies	72
D 282		D1-8 Do you perform tasks on full-wave bridge rectifier power supplies	74
D 283		D1-9 Do you perform tasks on three-phase rectifier power supplies	23
0145		33a(2). Filters (Capacitive, Inductive, L-Section, Pi-Section)	B
D 288		D2-1 Do you trace block diagrams of circuits containing power supply filters	68
D 289		D2-2 Do you trace schematic diagrams of power supply filters	67
D 292		D2-5 Do you perform tasks on capacitive power supply filters	60
D 293		D2-6 Do you perform tasks on inductive power supply filters	52
D 294		D2-7 Do you perform tasks on L-type power supply filters	34

D T Y	Tsk Nbr	Task Title	306 50
D	295	D2-8 Do you perform tasks on Pi-type power supply filters	29
D	296	D2-9 Do you perform tasks on T-type power supply filters	26
D	297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	59
D	298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	54
0146		33b. Isolate faulty power supplies 2b	
D	277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	88
D	290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	66
0147		33c. Troubleshoot circuits 2b	
D	278	D1-4 Do you troubleshoot power supplies to circuit level components	81
D	291	D2-4 Do you troubleshoot power supply filters to circuit level components	58
0148		34. Voltage Regulators (Shunt, Series EVR, IC EVR)	
0149		34a. Theory of operation B	
D	299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	70
D	300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	69
D	303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	64
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	62
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	53
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators	31
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	20

D T Y	Tsk Nbr	Task Title		306 50
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting		29
D	309	D3-11 Do you perform tasks on crow bar power supply voltage regulators		10
0150		34b. Isolate faulty voltage regulators	2b	
D	301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator		68
0151		34c. Troubleshoot circuits	2b	
D	302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components		65
0152		35. Resistive/Capacitive/Inductive (RCL) Circuits		
0153		35a. Basic operation	B	
E	310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits		35
0154		35b. Resonant operation	B	
E	312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits		31
0155		35c. Troubleshoot circuits	2b	
E	311	E1-2 Do you troubleshoot RCL circuits to circuit level components		33
E	313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components		31

D T Tsk Y Nbr	Task Title		306 50
0156	35d. Calculations	B	
E 314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits		13
E 315	E1-6 Do you calculate phase angle of RCL circuits		9
E 316	E1-7 Do you calculate values of power in RCL circuits		10
0157	36. Frequency Sensitive Filters (Low Pass, High Pass, Band Pass, Band Reject)		
0158	36a. Theory of operation	B	
E 317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters		30
E 320	E2-4 Do you align or adjust frequency sensitive filters		23
E 322	E2-6 Do you perform tasks on low pass frequency sensitive filters		31
E 323	E2-7 Do you perform tasks on high pass frequency sensitive filters		31
E 324	E2-8 Do you perform tasks on band pass frequency sensitive filters		31
E 325	E2-9 Do you perform tasks on band-reject frequency sensitive filters		22
E 326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters		4
0159	36b. Isolate faulty frequency sensitive filters	2b	
E 318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter		30
0160	36c. Troubleshoot circuits	2b	
E 319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components		28

D T Y	Tsk Nbr	Task Title	306 50
0161		36d. Calculations -	
E 321		E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	11
0162		37. Wave Generating Circuits	
0163		37a. Theory of operation	
0164		37a(1). Oscillators (LC, RC, Crystal) B	
F 327		F1-1 Do you trace block diagrams of circuits containing oscillators	67
F 328		F1-2 Do you trace schematic diagrams of oscillator circuits	66
F 331		F1-5 Do you align or adjust oscillator circuits	62
F 332		F1-6 Do the oscillators you work with use LC tank circuits	42
F 333		F1-7 Do the oscillators you work with use RC networks	40
F 334		F1-8 Do the oscillators you work with use crystals	65
F 335		F1-9 Do the oscillators you work with use phase lock loops (PLL)	17
F 336		F1-10 Do you perform tasks on series Hartley oscillator circuits	29
F 337		F1-11 Do you perform tasks on shunt Hartley oscillator circuits	28
F 338		F1-12 Do you perform tasks on Colpitts oscillator circuits	26
F 339		F1-13 Do you perform tasks on Clapp oscillator circuits	11
F 340		F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	17
F 341		F1-15 Do you perform tasks on crystal oscillator circuits	60
F 342		F1 16 Do you perform tasks on Wien bridge oscillator circuits	7
F 343		F1-17 Do you perform tasks on pulse generating oscillator circuits	22
F 344		F1-18 Do you perform tasks on blocked/blocking oscillator circuits	6
F 345		F1-19 Do you perform tasks on burst generators	6
F 346		F1-20 Do you perform tasks on RC phase shift oscillators	16

D T Y	Tsk Nbr	Task Title	306 50
0165		37a(2). Multivibrators (Astable, Bistable, Monostable)	B
F 347		F2-1 Do you trace block diagrams of circuits containing multivibrators	64
F 348		F2-2 Do you trace schematic diagrams of multivibrator circuits	63
F 351		F2-5 Do you adjust or align multivibrator circuits	33
F 352		F2-6 Do the multivibrators you work with use LC tank circuits	40
F 353		F2-7 Do the multivibrators you work with use RC networks	43
F 354		F2-8 Do the multivibrators you work with use Crystals	45
F 355		F2-9 Do you perform tasks on astable (free running) multivibrators	58
F 356		F2-10 Do you perform tasks on monostable (one shot) multivibrators	63
F 357		F2-11 Do you perform tasks on bistable (flip flop) multivibrators	65
F 358		F2-12 Do you perform tasks on triggered astable multivibrators	46
0166		37a(3). Waveshaping Circuits (Schmitt Trigger, Sawtooth, RC Integ/Diff)	B
F 359		F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	47
F 360		F3-2 Do you trace schematic diagrams of WSC	46
F 363		F3-5 Do you adjust or calibrate WSC	32
F 364		F3-6 Do you perform tasks on sawtooth wave generator WSC	39
F 365		F3-7 Do you perform tasks on trapazoidal (ramp) wave generator WSC	11
F 366		F3-8 Do you perform tasks on RC differentiating WSC	24
F 367		F3-9 Do you perform tasks on RL differentiating WSC	21
F 368		F3-10 Do you perform tasks on RC integrating WSC	21
F 369		F3-11 Do you perform tasks on RL integrating WSC	20
F 370		F3-12 Do you perform tasks on square wave generator WSC	44
F 371		F3-13 Do you perform tasks on rectangular wave generator WSC	22
F 372		F3-14 Do you perform tasks on Schmitt trigger WSC	46

D T Tsk Y Nbr	Task Title		306 50
0167	37b. Isolate faulty wave generating circuits	2b	
F 329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit		65
F 349	F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit		62
F 361	F3-3 Do you troubleshoot to isolate a faulty WSC		46
0168	37c. Troubleshoot circuits	2b	
F 330	F1-4 Do you troubleshoot oscillators to circuit level components		59
F 350	F2-4 Do you troubleshoot multivibrators to circuit level components		56
F 362	F3-4 Do you troubleshoot WSC to circuit level components		42
0169	38. Limiter Circuits (Diode, Zener Diode, Transistor)		
0170	38a. Theory of operation	B	
F 373	F4-1 Do you trace block diagrams of circuits containing limiters		44
F 374	F4-2 Do you trace schematic diagrams of limiter circuits		43
F 381	F4-9 Do you perform tasks on series diode limiter circuits		38
F 382	F4-10 Do you perform tasks on shunt diode limiter circuits		36
F 383	F4-11 Do you perform tasks on bias limiter circuits		22
F 384	F4-12 Do you perform tasks on zener diode circuits		41
F 385	F4-13 Do you perform tasks on transistor limiter circuits		30
F 386	F4-14 Do you perform tasks on triode limiter circuits		12
0171	38b. Isolate faulty limiters	2b	
F 377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit		40

D T Y	Tsk Nbr	Task Title		306 50
0172		38c. Troubleshoot circuits	2b	
F 378		F4-6 Do you troubleshoot limiters to circuit level components		37
0173		39. Clamper Circuits		
0174		39a. Theory of operation	B	
F 375		F4-3 Do you trace block diagrams of circuits containing clampers		39
F 376		F4-4 Do you trace schematic diagrams of clamper circuits		37
F 387		F4-15 Do you perform tasks on diode clamper circuits		35
F 388		F4-16 Do you perform tasks on bias clamper circuits		22
0175		39b. Isolate faulty clampers	2b	
F 379		F4-7 Do you troubleshoot to isolate a faulty clamper circuit		35
0176		39c. Troubleshoot circuits	2b	
F 380		F4-8 Do you troubleshoot clampers to circuit level components		33
0177		40. Digital Numbering Systems (Binary, Octal, Hexadecimal)		
0178		40a. Conversions	B	
G 389		G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal		22
G 390		G1-2 Do you convert octal numbers to binary or binary numbers to octal		12

D T Y	Tsk Nbr	Task Title	306 50
G	391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	19
G	392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	10
G	393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	19
G	394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	11
G	395	G1-7 Do you convert base number fractions to another base numbering system	9
0179		40b. Math operations B	
G	396	G1-8 Do you add binary numbers	20
G	397	G1-9 Do you subtract binary numbers	18
G	398	G1-10 Do you multiply binary numbers	12
G	399	G1-11 Do you divide binary numbers	11
G	400	G1-12 Do you add octal numbers	9
G	401	G1-13 Do you subtract octal numbers	9
G	402	G1-14 Do you add hexadecimal numbers	14
G	403	G1-15 Do you subtract hexadecimal numbers	13
0180		40c. Binary Code Systems B	
G	404	G1-16 Do you use binary coded decimal (BCD)	14
G	405	G1-17 Do you use gray codes	2
G	406	G1-18 Do you use ICAO codes	1
G	407	G1-19 Do you use excess-3 (XS3) codes	1
G	408	G1-20 Do you use parity bit codes	12
G	409	G1-21 Do you use biquinary codes	2
G	410	G1-22 Do you use ASCII codes	20
G	411	G1-23 Do you use EBCDI codes	3
0181		41. Digital Logic Functions (Main Logic Gates and Flip-Flops)	
0182		41a. Theory of operation B	
G	412	G1-24 Do you trace data flow through logic symbol diagrams	57
G	413	G1-25 Do you trace data flow through logic schematic diagrams	57

D T Tsk Y Nbr	Task Title		306 50
G 417	G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)		49
G 418	G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)		44
G 419	G1-31 Do you perform tasks related to AND gates		63
G 420	G1-32 Do you perform tasks related to OR gates		63
G 421	G1-33 Do you perform tasks related to inhibited gates logic functions		47
G 422	G1-34 Do you perform tasks related to NAND or NOR gates		62
G 423	G1-35 Do you perform tasks related to exclusive OR/NOR logic functions		60
G 424	G1-36 Do you perform tasks related to RS flip flops		34
G 425	G1-37 Do you perform tasks related to D(Data) flip flops		43
G 426	G1-38 Do you perform tasks related to T(Toggle) flip flops		40
G 427	G1-39 Do you perform tasks related to JK flip flops		27
G 428	G1-40 Do you perform tasks related to Schmidt triggers		51
G 429	G1-41 Do you perform tasks related to delay (One-shot) logic functions		51
G 430	G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")		31
G 431	G1-43 Do you perform tasks related to buffers		46
G 432	G1-44 Do you perform tasks related to inverters		53
G 433	G1-45 Do you perform tasks related to complemented flip flops		26
G 434	G1-46 Do you perform tasks related to complementing flip flops		26
0183	41b. Isolate faulty logic function circuits	2b	
G 414	G1-26 Do you troubleshoot digital systems to major units		55
G 415	G1-27 Do you troubleshoot digital systems subassemblies or circuit cards		57
0184	41c. Troubleshoot circuits	2b	
G 416	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC		48
0185	41d. Logic families (TTL and CMOS)	B	
G 438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)		16
G 439	G1-51 Do you perform tasks on DTL (diode transistor logic)		21

D T Y	Tsk Nbr	Task Title	306 50
G	440	G1-52 Do you perform tasks on TTL (transistor transistor logic)	26
G	441	G1-53 Do you perform tasks on ECL/CML (emitter coupled or current mode logic)	7
G	442	G1-54 Do you perform tasks on HTL (high threshold logic)	6
G	443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)	21
G	444	G1-56 Do you perform tasks on positive MOS ICs	10
G	445	G1-57 Do you perform tasks on negative MOS ICs	9
G	446	G1-58 Do you perform tasks on vertical MOS ICs	6
0186		42. Boolean Equations	
0187		42a. Diagram to equation	B
G	435	G1-47 Do you develop Boolean equations from logic circuits or diagrams	17
0188		42b. Equation to diagram	B
G	436	G1-48 Do you develop logic diagrams from Boolean equations	17
0189		42c. Simplify Expressions	-
G	437	G1-49 Do you simplify Boolean expressions using Boolean algebra	18
0190		43. Computers	
0191		43a. Operation principles	B
G	447	C2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems	13
G	454	G2-8 Do you perform tasks on analog computers	7
G	455	G2-9 Do you perform tasks on digital computers	18

D T Y	Tsk Nbr	Task Title		306 50
0192		43b. Load programs	2b	
G 448		G2-2 Do you load programs		16
0193		43c. Write/debug programs	2b	
G 449		G2-3 Do you write or debug programs		6
G 453		G2-7 Do you use computer flow charts or diagrams		11
0194		43d. Fault isolation	2b	
G 450		G2-4 Do you troubleshoot computers to a major unit		14
G 451		G2-5 Do you troubleshoot computers to a subassembly or circuit card		14
0195		43e. Circuit troubleshooting	2b	
G 452		G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC		6
0196		43f. Types of memories	B	
G 466		G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories		15
G 467		G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories		14
G 468		G2-22 Do you perform tasks on paper (tape, punch card) computer memories		2
G 469		G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories		2
0197		43g. Peripheral devices	B	
G 470		G2-24 Do you perform tasks on computer keyboards		17
G 471		G2-25 Do you perform tasks on computer character printers		11
G 472		G2-26 Do you perform tasks on magnetic tape drives		9

D T Y	Tsk Nbr	Task Title	306 50
G	473	G2-27 Do you perform tasks on microprocessor computer terminals	9
G	474	G2-28 Do you perform tasks on video display unit (VDU/ monitors)	11
G	475	G2-29 Do you perform tasks on paper tape readers/punches	4
G	476	G2-30 Do you perform tasks on paper card readers/punches	1
G	477	G2-31 Do you perform tasks on toggle or push button switch inputs	8
G	478	G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	7
G	479	G2-33 Do you perform tasks on modems	26
G	480	G2-34 Do you perform tasks on line printers	9
G	481	G2-35 Do you perform tasks on floppy disc drives	9
G	482	G2-36 Do you perform tasks on removable cartridge disc drives	4
G	483	G2-37 Do you perform tasks on removable pack disc drives	3
G	484	G2-38 Do you perform tasks on fixed winchester type disc drives	3

0198 43h. Programming languages -

G	456	G2-10 Do you use Basic computer language	9
G	457	G2-11 Do you use COBOL computer language	2
G	458	G2-12 Do you use FORTRAN computer language	0
G	459	G2-13 Do you use ADA computer language	1
G	460	G2-14 Do you use ATLAS computer language	0
G	461	G2-15 Do you use ELAN computer language	0
G	462	G2-16 Do you use PASCAL computer language	1
G	463	G2-17 Do you use RPG computer language	0
G	464	G2-18 Do you use Machine computer language	5
G	465	G2-19 Do you use C computer language	0

0199 44. Microprocessor Controlled Systems

0200 44a. Theory of operation B

G	485	G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	9

D T Y	Tsk Nbr	Task Title		306 50
0201		44b. Isolate faulty microprocessors	2b	
G 486		G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card		10
G 487		G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor		6
0202		45. Logic Circuits		
0203		45a. Theory of operation		
0204		45a(1). Counters (Synchronous/ Asynchronous-Up/Down counters)	B	
G 488		G3-1 Do you trace data flow through circuits containing counters		54
G 491		G3-4 Do you perform tasks on UP counters in logic circuits		43
G 492		G3-5 Do you perform tasks on DOWN counters in logic circuits		41
G 493		G3-6 Do you perform tasks on DECADE counters in logic circuits		24
G 494		G3-7 Do you perform tasks on ring counters in logic circuits		26
G 495		G3-8 Do you perform tasks on modulous counters in logic circuits		20
G 496		G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits		47
G 497		G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits		46
0205		45a(2). Registers (Shift and Storage)	B	
G 498		G3-11 Do you trace logic diagrams of circuits containing registers		49
G 501		G3-14 Do you perform tasks on shift registers in logic circuits		50

D T Y	Tsk Nbr	Task Title	306 50
G	502	G3-15 Do you perform tasks on storage registers in logic circuits	43
0206		45a(3). Combinational Logic Circuits (Half-adder, Full-adder, encoder, Decoder, Multiplexer, Demultiplexer, Count Detect) B	
G	503	G3-16 Do you trace data flow through combinational logic circuits	39
G	506	G3-19 Do you perform tasks on encoders	42
G	507	G3-20 Do you perform tasks on decoders	42
G	508	G3-21 Do you perform tasks on multiplexers	31
G	509	G3-22 Do you perform tasks on demultiplexers	24
G	510	G3-23 Do you perform tasks on comparators	32
G	511	G3-24 Do you perform tasks on parity generators or checkers	20
G	512	G3-25 Do you perform tasks on code converters	17
G	513	G3-26 Do you perform tasks on adders	38
G	514	G3-27 Do you perform tasks on subtractors	19
G	515	G3-28 Do you perform tasks on count detect circuits	16
0207		45b. Isolate faulty circuits 2b	
G	489	G3-2 Do you troubleshoot counter circuits to isolate a faulty counter	53
G	499	G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register	47
G	504	G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit	38
0208		45c. Troubleshoot circuits -	
G	490	G3-3 Do you troubleshoot counters to circuit level components	50
G	500	G3-13 Do you troubleshoot registers to circuit level components	43
G	505	G3-18 Do you troubleshoot combinational logic circuits to circuit level components	34

D T Y	Tsk Nbr	Task Title	306 50
0209		46. D/A, A/D Converters (Approx D/A and Ramp A/D)	
0210		46a. Theory of operation B	
G 516	G4-1	Do you trace data flow through A/D converters	41
G 517	G4-2	Do you trace data flow through D/A converters	41
G 520	G4-5	Do the converters you perform tasks on use flash conversion	3
G 521	G4-6	Do the converters you perform tasks on use successive approximation conversion	8
G 522	G4-7	Do the converters you perform tasks on use ramp conversion	3
G 523	G4-8	Do the converters you perform tasks on use R2R conversion	3
0211		46b. Isolate faulty converters 2b	
G 518	G4-3	Do you troubleshoot A/D converter circuits	36
G 519	G4-4	Do you troubleshoot D/A converter circuits	36
0212		47. Transmission Lines	
0213		47a. Theory of operation B	
H 527	H1-4	Do you construct transmission lines	9
H 528	H1-5	Do you match transmission line impedance with loads	17
H 531	H1-8	Do you perform tasks on open-wire transmission lines	13
H 532	H1-9	Do you perform tasks on twisted pair transmission lines	26
H 533	H1-10	Do you perform tasks on twin lead transmission lines	15
H 534	H1-11	Do you perform tasks on flexible coaxial transmission lines	14
H 535	H1-12	Do you perform tasks on rigid coaxial transmission lines	8
H 536	H1-13	Do you perform tasks on fiber-optic transmission lines	9

D T Y	Tsk Nbr	Task Title	306 50	
0214		47b. Perform Measurements	2b	
H 524	H1-1	Do you measure electrical length on transmission lines		6
H 525	H1-2	Do you measure physical length on transmission lines		8
H 526	H1-3	Do you measure standing wave ratio (SWR) on transmission lines		5
0215		47c. Calculations	-	
H 529	H1-6	Do you calculate the characteristic impedance (ZO) of transmission lines		6
0216		47d. Isolate faulty transmission lines	-	
H 530	H1-7	Do you troubleshoot transmission lines		25
0217		48. Waveguides		
0218		48a. Theory of operation	B	
H 537	H1-14	Do you trace schematic or block diagrams of circuits containing waveguides		1
H 539	H1-16	Do you pressurize or purge waveguide assemblies		1
H 540	H1-17	Do you measure standing wave ratio for waveguide assemblies		1
H 541	H1-18	Do you remove or install waveguide or associated coupling hardware components		1
0219		48b. Isolate faulty waveguides	2b	
H 538	H1-15	Do you troubleshoot circuits to isolate a faulty waveguide assembly		1

D T Y	Tsk Nbr	Task Title	306 50
0220		49. Microwave Oscillators & Amplifiers	
0221		49a. Theory of operation B	
H 542	H2-1	Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	1
H 545	H2-4	Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	0
H 546	H2-5	Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	0
H 547	H2-6	Do you perform tasks on reflex klystron microwave oscillators and amplifiers	0
H 548	H2-7	Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	0
H 549	H2-8	Do you perform tasks on magnetron microwave oscillators and amplifiers	0
H 550	H2-9	Do you perform tasks on backward wave oscillator	0
H 551	H2-10	Do you perform tasks on parametric amplifiers	0
H 552	H2-11	Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	0
0222		49b. Tune or Adjust 2b	
H 544	H2-3	Do you tune or adjust microwave oscillators or amplifiers	0
0223		49c. Isolate faulty microwave oscillators or amplifiers 2b	
H 543	H2-2	Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	1
0224		50. Resonant Cavities	

D T Y	Task Nbr	Task Title		306 50
0225		50a. Theory of operation	B	
H 553	H3-1	Do you trace schematic or block diagrams of circuits containing resonant cavities		1
H 558	H3-6	Do you perform tasks on probe resonant cavities		0
H 559	H3-7	Do you perform tasks on loop resonant cavities		0
H 560	H3-8	Do you perform tasks on aperture (iris/window) resonant cavities		0
0226		50b. Isolate faulty resonant cavities	2b	
H 554	H3-2	Do you troubleshoot circuits to isolate a faulty resonant cavity		1
H 557	H3-5	Do you measure frequency of resonant cavities		1
0227		50c. Tune/adjust	2b	
H 555	H3-3	Do you tune or adjust resonant cavities electrically		1
H 556	H3-4	Do you tune or adjust resonant cavities physically		1
0228		51. Transmitters		
0229		51a. Theory of operation		
0230		51a(1). Amplitude Modulation	-	
H 561	H4-1	Do you use "AM" modulation principles		3
H 562	H4-2	Do you trace block diagrams of AM transmitters		3
H 563	H4-3	Do you trace block diagrams of AM transmitter subassemblies or circuit cards		3
H 564	H4-4	Do you trace schematic diagrams of AM transmitter subassemblies or circuits cards		3
H 568	H4-8	Do you align or adjust AM transmitters or circuits		3
H 569	H4-9	Do you calculate percentage of modulation for AM transmitters		1

D T Y	Tsk Nbr	Task Title	306 50
0231	51a(2). Frequency Modulation	-	
H 593	H4-33	Do you use "FM" modulation principles	4
H 594	H4-34	Do you trace block diagrams of FM transmitters	4
H 595	H4-35	Do you trace block diagrams of FM transmitter subassemblies or circuit cards	3
H 596	H4-36	Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	3
H 600	H4-40	Do you align or adjust FM transmitters or circuits	3
H 601	H4-41	Do you calculate modulation index for FM transmitters	1
H 602	H4-42	Do you measure frequency deviation for FM transmitters	2
0232	51a(3). Single Side Band	-	
H 578	H4-18	Do you trace block diagrams of single side band (SSB) transmitters	2
H 579	H4-19	Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	1
H 580	H4-20	Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	1
H 584	H4-24	Do you align or adjust SSB transmitters or circuits	1
H 585	H4-25	Do you calculate percentage of modulation for SSB transmitters	0
0233	51a(4). Pulse Modulation	-	
H 612	H4-52	Do you use "PM" modulation principles	2
H 613	H4-53	Do you trace block diagrams of PM transmitters	2
H 614	H4-54	Do you trace block diagrams of PM transmitter subassemblies or circuit cards	2
H 615	H4-55	Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards	2
H 619	H4-59	Do you align or adjust PM transmitters or circuits	2
H 620	H4-60	Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	0
H 621	H4-61	Do you measure PRT, PRF or pulse width for PM transmitters	1

D T Y	Tsk Nbr	Task Title	306 50
0234		51b. Isolate faulty transmitters -	
H 565	H4-5	Do you troubleshoot AM transmitters to major units	3
H 566	H4-6	Do you troubleshoot AM transmitters to subassemblies or circuit cards	3
H 581	H4-21	Do you troubleshoot SSB transmitters to major units	2
H 582	H4-22	Do you troubleshoot SSB transmitters to subassemblies or circuit cards	1
H 597	H4-37	Do you troubleshoot FM transmitters to major units	3
H 598	H4-38	Do you troubleshoot FM transmitters to sub-assemblies or circuit cards	3
H 616	H4-56	Do you troubleshoot PM transmitters to major units	2
H 617	H4-57	Do you troubleshoot PM transmitters to sub-assemblies or circuit cards	2
0235		51c. Troubleshoot circuits -	
H 567	H4-7	Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	2
H 583	H4-23	Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	1
H 599	H4-39	Do you troubleshoot FM transmitter subassemblies or circuit cards or circuit level components	2
H 618	H4-58	Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	2
0236		52. Receivers	
0237		52a. Theory of operation	
0238		52a(1). Amplitude Modulation -	
H 570	H4-10	Do you use "AM" demodulation principles	2
H 571	H4-11	Do you trace block diagrams of AM receivers	2
H 572	H4-12	Do you trace block diagrams of AM receiver subassemblies or circuit cards	2

D T Y	Tsk Nbr	Task Title	306 50
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	2
H	577	H4-17 Do you align or adjust AM receivers or circuits	2
0239		52a(2). Frequency Modulation -	
H	603	H4-43 Do you use "FM" demodulation principles	3
H	604	H4-44 Do you trace block diagrams of FM receivers	3
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	2
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	2
H	610	H4-50 Do you align or adjust FM receivers or circuits	2
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	0
0240		52a(3). Single Side Band -	
H	586	H4-26 Do you trace block diagrams of SSB receivers	2
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	1
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	1
H	592	H4-32 Do you align or adjust SSB receivers or circuits	1
0241		52a(4). Pulse Modulation -	
H	622	H4-62 Do you use "PM" demodulation principles	2
H	623	H4-63 Do you trace block diagrams of PM receivers	2
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	2
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	2
H	629	H4-69 Do you align or adjust PM receivers or circuits	2
0242		52b. Isolate faulty receivers -	
H	574	H4-14 Do you troubleshoot AM receivers to major units	2
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	2
H	589	H4-29 Do you troubleshoot SSB receivers to major units	2

D T Y	Tsk Nbr	Task Title	306 50	
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards		1
H	607	H4-47 Do you troubleshoot FM receivers to major units		2
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards		2
H	626	H4-66 Do you troubleshoot PM receivers to major units		2
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards		2
0243		52c. Troubleshoot circuits	-	
H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components		1
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components		1
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components		1
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components		1
0244		53. Transmission Power		
0245		53a. Perform measurements	B	
I	660	I1-1 Do you measure RF power		3
I	661	I1-2 Do you measure RF peak power		2
I	662	I1-3 Do you measure RF average power		2
I	663	I1-4 Do you measure RF effective power		1
I	664	I1-5 Do you measure RF output power using wattmeters		2
0246		53b. Calculations	B	
I	665	I2-1 Do you calculate RF apparent power		1
I	666	I2-2 Do you calculate RF true power		1
I	667	I2-3 Do you calculate RF power loss or gain in db		3

D T Tsk Y Nbr	Task Title	306 50
0247	54. Antennas	
0248	54a. Theory of operation -	
H 634	H5-5 Do you plot graph radiation patterns	1
H 637	H5-8 Do you work with Yagi antennas	1
H 638	H5-9 Do you work with dipole antennas	3
H 639	H5-10 Do you work with slotted antennas	1
H 640	H5-11 Do you work with rotary antennas	2
H 641	H5-12 Do you work with hertz antennas	0
H 642	H5-13 Do you work with marconi antennas	0
H 643	H5-14 Do you work with rhombic antennas	0
H 644	H5-15 Do you work with scimitar antennas	0
H 645	H5-16 Do you work with parabolic antennas	1
H 646	H5-17 Do you work with ground plane antennas	1
H 647	H5-18 Do you perform tasks on rotary antenna arrays	1
H 648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	0
H 649	H5-20 Do you perform tasks on broadside antenna arrays	1
H 650	H5-21 Do you perform tasks on cardioid antenna arrays	1
H 651	H5-22 Do you perform tasks on collinear antenna arrays	0
H 652	H5-23 Do you perform tasks on phase antenna arrays	1
H 653	H5-24 Do you perform tasks on planar antenna arrays	0
H 654	H5-25 Do you perform tasks on antennas with vertical polarization	2
H 655	H5-26 Do you perform tasks on antennas with horizontal polarization	2
H 656	H5-27 Do you perform tasks on antennas with circular polarization	1
H 657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	3
H 658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	3
H 659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	3
0249	54b. Perform alignments -	
H 630	H5-1 Do you physically align antennas	6
H 631	H5-2 Do you electrically align antennas	3
H 636	H5-7 Do you measure standing wave ratio (SWR) for antennas	1

D T Y	Tsk Nbr	Task Title	306 50
0250		54c. Isolate faulty antennas -	
H 632	H5-3	Do you troubleshoot loading of antennas	2
H 633	H5-4	Do you troubleshoot coupling of antennas	3
H 635	H5-6	Do you troubleshoot antenna components	3
0251		55. Microphones	
0252		55a. Theory of operation -	
J 668	J1-1	Do you trace block diagrams of circuits containing microphones	19
J 669	J1-2	Do you trace schematic diagrams of microphone circuits	18
J 672	J1-5	Do you work on carbon microphones	17
J 673	J1-6	Do you work on capacitor microphones	4
J 674	J1-7	Do you work on crystal microphones	5
J 675	J1-8	Do you work on dynamic microphones	12
J 676	J1-9	Do you work on velocity ribbon microphones	3
0253		55b. Isolate faulty microphones -	
J 670	J1-3	Do you troubleshoot to isolate a faulty microphone	21
0254		55c. Troubleshoot circuits -	
J 671	J1-4	Do you troubleshoot microphones	11
0255		56. Speakers	
0256		56a. Theory of operation -	
J 677	J1-10	Do you trace block diagrams of circuits containing speakers	20

D T Y	Tsk Nbr	Task Title		306 50
J	678	J1-11 Do you trace schematic diagrams of speaker circuits		18
0257		56b. Isolate faulty speakers	-	
J	679	J1-12 Do you troubleshoot to isolate a faulty speaker		19
0258		56c. Troubleshoot circuits	-	
J	680	J1-13 Do you troubleshoot speakers		10
0259		57. Photosensitive Devices		
0260		57a. Theory of operation	B	
J	681	J2-1 Do you trace block diagrams of circuits containing photosensitive devices		3
J	682	J2-2 Do you trace schematic diagrams of photosensitive device circuits		3
J	684	J2-4 Do you adjust or calibrate photosensitive devices		1
J	685	J2-5 Do you work on photodiodes		3
J	686	J2-6 Do you work on phototransistors		2
J	687	J2-7 Do you work on phototubes		0
J	688	J2-8 Do you work on photo-SCRs		0
J	689	J2-9 Do you work on photocells (Photoconductive or Photovoltaic)		1
0261		57b. Isolate faulty photosensitive devices	2b	
J	683	J2-3 Do you troubleshoot to isolate a faulty photo-sensitive device		3
0262		58. Display Tubes		

D T Tsk Y Nbr	Task Title	306 50
0263	58a. Theory of operation -	
J 690	J3-1 Do you trace block diagrams of circuits containing display tubes	0
J 691	J3-2 Do you trace schematic diagrams of display tubes or circuits	0
J 693	J3-4 Do you adjust or calibrate display tubes or circuits	0
J 694	J3-5 Do you work on direct view storage tubes (DVST)	0
J 695	J3-6 Do you work on multiple mode storage tubes (MMST)	0
J 696	J3-7 Do you work on scan converter tubes (SCT)	0
0264	58b. Isolate faulty display tubes -	
J 692	J3-3 Do you troubleshoot to isolate a faulty display tube	0
0265	59. Support Subjects	
0266	59a. Safety applicable to electronics B	
0267	59b. First aid for electrical shock B	
0268	59c. Electrostatic Discharge (ESD) Control B	
0269	Tasks not referenced	
B 175	B3-4 Do you use audio sine-wave signal generators	54
B 176	B3-5 Do you use audio non-sinusoidal signal generators	17
B 177	B3-6 Do you use RF less than 1,000MH signal generators	19
B 178	B3-7 Do you use RF greater than 1,000MH signal generators	9
B 179	B3-8 Do you use white noise signal generators	7
B 180	B3-9 Do you use pattern signal generators	33

D T Y	Tsk Nbr	Task Title	306 50
B	181	B3-10 Do you use pseudo-random signal generators	12
B	182	B3-11 Do you use time mark signal generators	11
B	183	B3-12 Do you use multi-function (square/sine/triangular) signal generators	34
B	184	B3-13 Do you use TV signal signal generators	3
D	284	D1-10 Do you perform tasks on voltage multipliers (doublers/triplers)	40
D	285	D1-11 Do you perform tasks on DC to DC converters	60
D	286	D1-12 Do you perform tasks on inverters (DC to AC converters)	46
D	287	D1-13 Do you perform tasks on switching power supplies	16
J	697	J4-1 Do you trace block diagrams of TV systems or subassemblies	0
J	698	J4-2 Do you trace schematic diagrams of TV systems or component circuits	0
J	699	J4-3 Do you troubleshoot TV systems to major subassemblies	0
J	700	J4-4 Do you troubleshoot TV systems to circuit level components	0
J	701	J4-5 Do you adjust or calibrate TV systems or components	0
J	702	J4-6 Do you trace block diagrams of laser systems or subassemblies	0
J	703	J4-7 Do you trace schematic diagrams of laser systems or component circuits	0
J	704	J4-8 Do you troubleshoot laser systems to major subassemblies	0
J	705	J4-9 Do you troubleshoot laser systems to circuit level components	0
J	706	J4-10 Do you adjust or calibrate laser systems or components	0
J	707	J4-11 Do you trace block diagrams of infrared systems or subassemblies	1
J	708	J4-12 Do you trace schematic diagrams of infrared systems or component circuits	0
J	709	J4-13 Do you troubleshoot infrared systems to major subassemblies	0
J	710	J4-14 Do you troubleshoot infrared systems circuit level components	0
J	711	J4-15 Do you inspect, clean, or service infrared systems or components	1
J	712	J4-16 Do you adjust or calibrate infrared systems or components	0

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Module Statement						

Description of Reported Task Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Task Statement						
2	F0083	GP0089/PMP	All DAFSC 30650	235	24.48	25.37	97.45	.00	712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in matched to POI L3ABR30630, dated 22 Sep 86 order. Data for this report was collected from job incumbents during the period September 1987 - April 1988

Percent members responding "YES" is shown for each specialty listed.

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6811.

D T Y	Tsk Nbr	Task Title	306 50
0001		POI L3ABR30630 002 ELECTRONIC CRYPTOGRAPHIC COMMUNICATIONS EQUIPMENT SPECIALIST Dated 22 Sep 86 AIR FORCE MILITARY TRAINING CENTER	
0002		I. DC Circuits	
0003		I 1. Orientation	1.0
0004		I 1a. Be briefed on applicable portions of ZZI 0040. STS: None Meas: None	
0005		I 2. Operation	9
0006		I 2a. Using powers of ten, slove for the unknown value, with 3 out of 5 correct. STS: 19a Meas: W	(3)

D T Y	Tsk Nbr	Task Title		306 50
0007		I 2b. Given numerical values, convert them to selected metric prefixes, with 3 out of 5 correct. STS: 19a Meas: W	(4)	
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)		73
0008		I 3. DC Circuits	13	
0009		I 3a. Given 10 representations of differences of potential, draw the direction of currect flow, with 7 out of 10 correct. STS: 19a Meas: W	(4)	
A	2	A1-2 Do you use basic DC electrical/electronic terms		97
0010		I 3b. Given 5 resistors, identify the ohmic value of each using the color, with 4 out of 5 correct. STS: 19a Meas: W	(5)	
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)		73
A	13	A1-13 Do you determine ohmic value of a resistor using the color code		75
0011		I 3c. Given 5 resistors, use the multimeter measure the ohmic value of each + or - 10%, with 4 out of 5 correct, with a maximum time of 15 minutes. STS: 18a, 18b(2), 7c(1) Meas: P	(4)	
A	14	A1-14 Do you ohm check resistors		83
B	159	B1-7 Do you use the multimeter to measure circuit resistance		74
B	160	B1-8 Do you use the multimeter to measure component resistance		85
B	188	B4-4 Do you use digital multimeters		95

D T Y	Tsk Nbr	Task Title	306 50
	0012	I 5. Series Circuits 15	
	0013	I 5a. Given 2 schematic drawings of series resistive circuits, solve for 10 specific values in each drawing, with 12 out of 20 correct. STS: 19a Meas: W (7)	
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)	73
A	4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries	93
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power	45
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors	89
	0014	I 5b. Using a trainer and a multimeter, measure 5 unknown values of voltage/current in a series resistive circuit + or - 5%, with 4 out of 5 correct, with a maximum time of 30 minutes. STS: 18b(2), 7c(1) Meas: P (3)	
B	153	B1-1 Do you use the multimeter to measure DC voltage values	97
B	156	B1-4 Do you use the multimeter to measure DC current values	77
	0015	I 5c. Given a schematic drawing of a series resistive circuit with theoretical malfunctions, identify the relationship between current, voltage and resistance, with 3 out of 4 correct. STS: 19b(1) Meas: W (3)	
A	5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	94

D T Y	Tsk Nbr	Task Title		306 50
	0016	I 5d. Using a trainer and a multimeter, identify malfunctioning components and conditions in series resistive circuits, with 4 out of 5 correct, with a time limit of 10 minutes for each problem. STS: 19b(1) Meas: P	(2)	
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor		84
A	14	A1-14 Do you ohm check resistors		83
	0017	I 7. Parallel Circuits	12	
	0018	I 7a. Given 2 schematic drawings of parallel resistive circuits, solve for 10 specified values in each drawing, with 12 out of 20 correct. STS: 19a Meas: W	(6)	
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power		45
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors		89
	0019	I 7b. Given a schematic drawing of a parallel resistive circuit and theoretical malfunctions, identify the relationships between current, voltage and resistance, with 3 out of 4 correct. STS: 19b(2) Meas: W	(3)	
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power		45
	0020	I 7c. Using a trainer and a multimeter, identify malfunctioning components and conditions in parallel resistive circuits, with 4 out of 5 correct, with a time limit of 10 minutes for each problem. STS: 19b(2) Meas: P	(3)	
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor		84

D T Y	Tsk Nbr	Task Title	306 50	
A	14	A1-14 Do you ohm check resistors	83	
0021		I 9. Series-Parallel Circuits	14	
0022		I 9a. Given a schematic drawing of a series-parallel resistive circuit, solve for 20 specified values, with 12 out of 20 correct. STS: 19b(3) Meas: W	(8)	
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power	45	
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors	89	
0023		I 9b. Given a schematic drawing of a series-parallel resistive circuit with theoretical malfunctions, identify the relationships between current, voltage and resistance, with 4 out of 5 correct. STS: 19b(3) Meas: W	(3)	
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power	45	
0024		I 9c. Using a trainer and a multimeter, identify malfunctioning components and conditions in series-parallel resistive circuits, with 4 out of 5 correct, with a time limit of 10 minutes for each problem. STS: 19b(3) Meas: P	(3)	
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor	84	
A	14	A1-14 Do you ohm check resistors	83	
0025		II. AC Circuits		

D T Tsk Y Nbr	Task Title		306 50
0026	II 1. AC Circuits	5	
0027	II 1a. Given a list of terms and a list of definitions concerning alternating current and alternating voltage, match the term with its definition, with 9 out of 12 correct. STS: 19a Meas: W	(3)	
A 3	A1-3 Do you use basic AC electrical/electronic terms		95
0028	II 1b. Given the period or frequency of an AC signal, calculate the unknown values, with 4 out of 5 correct. STS: 19a Meas: W	(2)	
A 7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage		45
A 8	A1-8 Do you calculate values of frequency, phase relationship, or wave length		46
0029	II 2. Test Equipment	15	
0030	II 2a. Using a signal generator and oscilloscope, adjust the controls necessary to display specified signals on the oscilloscope, + or - 5%, with 3 out of 4 correct, with a time limit of 5 minutes for each signal. STS: 18a, 18b(1), 18b(5) Meas: P		
B 154	B1-2 Do you use the multimeter to measure AC voltage values		94
B 157	B1-5 Do you use the multimeter to measure AC current values		70
B 161	B2-1 Do you use the oscilloscope to measure time to determine frequency		74
B 162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)		76
B 163	B2-3 Do you use the oscilloscope to measure AC voltage		86
B 164	B2-4 Do you use the oscilloscope to measure DC voltage		90
B 167	B2-7 Do you use the oscilloscope to observe signal/data patterns		89

D T Y	Tsk Nbr	Task Title	306 50
B	170	B2-10 Do you use attenuator probes with oscilloscopes	69
B	172	B3-1 Do you use signal generators (SG) to perform operational checks	60
B	174	B3-3 Do you use SG to troubleshoot circuits	58
B	183	B3-12 Do you use multi-function (square/sine/triangular) signal generators	34

0031 II 4. Inductive Reactance 15

0032 II 4a. Given 2 schematic drawings of inductive circuits, solve for 10 specified values in each drawing, with 12 out of 20 correct. STS: 19a Meas: W

A	8	A1-8 Do you calculate values of frequency, phase relationship, or wave length	46
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors	83
A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils	67
A	21	A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil	65
A	22	A1-22 Do you calculate values of circuit total inductance	23
A	23	A1-23 Do you calculate values of circuit or component inductive reactance	21
A	24	A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors	26
A	26	A1-26 Do you ohm check inductors	57
B	169	B2-9 Do you use the oscilloscope to observe phase relationships	66
F	359	F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	47
F	360	F3-2 Do you trace schematic diagrams of WSC	46
F	367	F3-9 Do you perform tasks on RL differentiating WSC	21
F	369	F3-11 Do you perform tasks on RL integrating WSC	20

0033 II 5. Capacitive Reactance 15

D T Y	Tsk Nbr	Task Title	306 50
0034		II 5a. Given 2 schematic drawings of capacitive circuits, solve for 10 specified values in each drawing, with 12 out of 20 correct. STS: 19a Meas: W	
A	8	A1-8 Do you calculate values of frequency, phase relationship, or wave length	46
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors	83
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors	85
A	28	A1-28 Do you troubleshoot circuits to isolate a faulty capacitor	83
A	29	A1-29 Do you calculate values of circuit total capacitance	31
A	30	A1-30 Do you calculate values of circuit or component capacitive reactance	27
A	31	A1-31 Do you calculate values of circuit or component voltage or current in circuits containing capacitors	31
A	33	A1-33 Do you ohm check capacitors	78
F	366	F3-8 Do you perform tasks on RC differentiating WSC	24
F	368	F3-10 Do you perform tasks on RC integrating WSC	21
0035		II 6. Filters, Transformers and Relays	24
0036		II 6a. Given schematic drawings of RC and RL filters, identify the configuration of each, with 3 out of 4 correct. STS: 19a MEAS: W	(5)
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors	85
D	292	D2-5 Do you perform tasks on capacitive power supply filters	60
D	293	D2-6 Do you perform tasks on inductive power supply filters	52
D	294	D2-7 Do you perform tasks on L-type power supply filters	34
E	322	E2-6 Do you perform tasks on low pass frequency sensitive filters	31
E	323	E2-7 Do you perform tasks on high pass frequency sensitive filters	31

D T Y	Tsk Nbr	Task Title	306 50
	0037	II 6b. Given schematic drawings of RCL filters, identify the configuration of each, with 3 out of 4 correct. STS: 19a Meas: W (5)	
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors	85
E	310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	35
E	312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	31
E	314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits	13
E	317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters	30
E	324	E2-8 Do you perform tasks on band pass frequency sensitive filters	31
E	325	E2-9 Do you perform tasks on band-reject frequency sensitive filters	22
	0038	II 6c. Using a trainer and test equipment, identify malfunctioning components and conditions in RCL circuits with 3 out of 4 correct, with a time limit of 15 minutes for each problem. STS: 19b(3) Meas: P (6)	
A	26	A1-26 Do you ohm check inductors	57
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors	85
A	33	A1-33 Do you ohm check capacitors	78
A	104	A3-22 Do you perform tasks on zener diodes	69
E	311	E1-2 Do you troubleshoot RCL circuits to circuit level components	33
E	313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	31
E	318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter	30
E	319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components	28

D T Y	Tsk Nbr	Task Title	306 50
0039		II 6d. Using a trainer and test equipment, identify the malfunctioning transformer windings and conditions, with 3 out of 4 correct, with a time limit of 10 minutes for each problem. STS: 19c Meas: P (8)	
A	15	A1-15 Do you trace schematic or block diagrams of circuits containing relays	79
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers	80
A	36	A1-36 Do you troubleshoot circuits to isolate a faulty transformer	77
A	37	A1-37 Do you calculate transformer voltage or current step-up or step-down ratios	35
A	38	A1-38 Do you calculate impedance of transformers	22
A	40	A1-40 Do you ohm check transformers	65
A	41	A1-41 Do you measure transformer output voltage	73
A	104	A3-22 Do you perform tasks on zener diodes	69
0040		III. Solid State Devices	
0041		III 1. PN Junctions 13	
0042		III 1a. Given schematic drawings of limiters with a specified input, identify the output and type limiter with 6 out of 8 correct. STS: 19a Meas: W (9)	
A	83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	81
A	87	A3-5 Do you use diode substitution information	39
F	374	F4-2 Do you trace schematic diagrams of limiter circuits	43
F	376	F4-4 Do you trace schematic diagrams of clamper circuits	37
F	381	F4-9 Do you perform tasks on series diode limiter circuits	38
F	382	F4-10 Do you perform tasks on shunt diode limiter circuits	36
F	383	F4-11 Do you perform tasks on bias limiter circuits	22
F	384	F4-12 Do you perform tasks on zener diode circuits	41
F	387	F4-15 Do you perform tasks on diode clamper circuits	35
F	388	F4-16 Do you perform tasks on bias clamper circuits	22

D T Y	Tsk Nbr	Task Title	306 50
	0043	III 1b. Using a trainer and test equipment, determine the malfunctioning components and conditions in limiter circuits with 3 out of 4 correct, with a time limit of 10 minutes for each problem. STS: 19b(3) Meas: P (4)	
A	84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	80
A	85	A3-3 Do you check diodes using an ohmmeter	78
A	88	A3-6 Do you use diode color codes	30
F	377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	40
F	378	F4-6 Do you troubleshoot limiters to circuit level components	37
	0044	III 3. Transistor Amplifiers 48	
	0045	III 3a. Given schematic drawings of transistor amplifiers, identify the output wave form, function, or operational characteristics, with 9 out of 12 correct. STS: 19a Meas: W (21)	
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors	83
A	89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors	85
C	199	C1-1 Do you trace block diagrams of circuits containing transistor amplifiers	69
C	200	C1-2 Do you trace schematic diagrams of transistor amplifier circuits	69
C	206	C1-8 Do you calculate values of transistor amplifier voltage, current or power gain	25
C	210	C1-12 Do you work on push-pull transistor amplifiers	50
C	218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	34
C	220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	26
C	221	C2-4 Do you perform tasks on self-bias stabilization amplifiers	25
C	249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	40
C	251	C5-3 Do you calculate op amp gain	13
C	253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	36

D T Y	Tsk Nbr	Task Title	306 50
C	254	C5-6 Do you use or apply operational amplifiers as differential/comparators	18
C	260	C5-12 Do you use or apply operational amplifiers for differentiators	13

0046 III 3b. Using a trainer and test equipment, identify the malfunctioning components and conditions in a 4-stage transistor amplifier with 6 out of 8 correct, with a time limit of 15 minutes for each problem. STS: 19b(3) Meas: P (27)

A	33	A1-33 Do you ohm check capacitors	78
A	90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor	84
A	91	A3-9 Do you check transistors using an ohmmeter	82
C	201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier	68
C	202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components	64
C	203	C1-5 Do you troubleshoot transistor amplifier distortion	36
C	205	C1-7 Do you measure transistor amplifier voltage, current, or power gain	47
C	208	C1-10 Do you work on cascade-connected transistor amplifiers	23
C	211	C1-13 Do you work on audio transistor amplifiers	50
C	219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	33
C	225	C3-1 Do you trace block diagrams of circuits containing coupling circuits	46
C	226	C3-2 Do you trace schematic diagrams of coupling circuits	46
C	227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	44
C	228	C3-4 Do you troubleshoot coupling circuits to circuit level components	40
C	229	C3-5 Do you perform tasks on direct coupling circuits	43
C	230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits	37
C	231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits	33
C	232	C3-8 Do you perform tasks on transformer coupling circuits	38

0047 III 5. Unique Solid Devices 14

D T Y	Tsk Nbr	Task Title	306 50
	0048	III 5a. Given schematic drawings of unique solid state devices, identify the output wave forms, functions, or operational characteristics, with 6 out of 8 correct. STS: 19a Meas: W	
A	98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	54
A	102	A3-20 Do you perform tasks on field effect transistors (FET)	36
A	103	A3-21 Do you perform tasks on unijunction transistors (UJT)	45
A	104	A3-22 Do you perform tasks on zener diodes	69
A	109	A3-27 Do you perform tasks on silicon controlled rectifiers (SCR)	49
C	222	C2-5 Do you perform tasks on thermistor stabilization amplifiers	26
F	359	F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	47
F	360	F3-2 Do you trace schematic diagrams of WSC	46
F	363	F3-5 Do you adjust or calibrate WSC	32
F	364	F3-6 Do you perform tasks on sawtooth wave generator WSC	39
	0049	IV. Basic Circuits	
	0050	IV 1. Power Supplies 26	
	0051	IV 1a. Given schematic drawings of a power supply, identify the output waveform at a specified test points, functions, or operational characteristics, with 7 out of 10 correct. STS: 19c Meas: W (10)	
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers	80
D	275	D1-1 Do you trace block diagrams of circuits containing power supplies	86
D	276	D1-2 Do you trace schematic diagrams of power supply circuits	85
D	280	D1-6 Do you perform tasks on half-wave rectifier power supplies	67
D	281	D1-7 Do you perform tasks on full-wave rectifier power supplies	72

D T	Tsk Nbr	Task Title	306 50
D	282	D1-8 Do you perform tasks on full-wave bridge rectifier power supplies	74
D	284	D1-10 Do you perform tasks on voltage multipliers (doublers/triplers)	40
D	288	D2-1 Do you trace block diagrams of circuits containing power supply filters	68
D	289	D2-2 Do you trace schematic diagrams of power supply filters	67
D	292	D2-5 Do you perform tasks on capacitive power supply filters	60
D	293	D2-6 Do you perform tasks on inductive power supply filters	52
D	294	D2-7 Do you perform tasks on L-type power supply filters	34
D	295	D2-8 Do you perform tasks on Pi-type power supply filters	29
D	296	D2-9 Do you perform tasks on T-type power supply filters	26
D	297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	59
D	298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	54
D	299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	70
D	300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	69
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	29

0052 IV 1b. Using a trainer and test equipment, identify the malfunctioning components and conditions in a power supply, with 4 out of 5 correct, with a time limit of 10 minutes for each problem. STS: 19c, 7c(1)
Meas: P (16)

A	83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	81
A	84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	80
A	85	A3-3 Do you check diodes using an ohmmeter	78
A	89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors	85
A	90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor	84
A	91	A3-9 Do you check transistors using an ohmmeter	82
B	165	B2-5 Do you use the oscilloscope to measure ripple voltages	87
D	277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	88
D	278	D1-4 Do you troubleshoot power supplies to circuit level components	81
D	279	D1-5 Do you align or adjust power supplies	87
D	290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	66

D T Y	Tsk Nbr	Task Title	306 50
D	291	D2-4 Do you troubleshoot power supply filters to circuit level components	58
D	301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	68
D	302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	65
	0053	IV 3. Oscillators 10	
	0054	IV 3a. Given schematic drawings of oscillators, identify characteristics and functional operations, with 7 out of 10 correct. STS: 19a Meas: W (5)	
A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils	67
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers	80
D	286	D1-12 Do you perform tasks on inverters (DC to AC converters)	46
F	327	F1-1 Do you trace block diagrams of circuits containing oscillators	67
F	328	F1-2 Do you trace schematic diagrams of oscillator circuits	66
F	331	F1-5 Do you align or adjust oscillator circuits	62
F	332	F1-6 Do the oscillators you work with use LC tank circuits	42
F	333	F1-7 Do the oscillators you work with use RC networks	40
F	334	F1-8 Do the oscillators you work with use crystals	65
F	336	F1-10 Do you perform tasks on series Hartley oscillator circuits	29
F	337	F1-11 Do you perform tasks on shunt Hartley oscillator circuits	28
F	338	F1-12 Do you perform tasks on Colpitts oscillator circuits	26
	0055	IV 3b. Given schematic drawings of non-sinusoidal circuits, identify characteristics and functional operations, with 6 out of 8 correct. STS: 19a Meas: W (5)	
F	347	F2-1 Do you trace block diagrams of circuits containing multivibrators	64
F	348	F2-2 Do you trace schematic diagrams of multivibrator circuits	63
F	351	F2-5 Do you adjust or align multivibrator circuits	33
F	353	F2-7 Do the multivibrators you work with use RC networks	43

D T Y	Tsk Nbr	Task Title	306 50
F	355	F2-9 Do you perform tasks on astable (free running) multivibrators	58
F	356	F2-10 Do you perform tasks on monostable (one shot) multivibrators	63
F	357	F2-11 Do you perform tasks on bistable (flip flop) multivibrators	65
F	372	F3-14 Do you perform tasks on Schmitt trigger WSC	46
G	428	G1-40 Do you perform tasks related to Schmidt triggers	51
G	429	G1-41 Do you perform tasks related to delay (One-shot) logic functions	51

0056 V. Logic and Integrated Circuits

0057 V 1. Integrated Circuits 9

0058 V 1a. Given a list of terms and a list of definitions concerning IC principles, match the term to the definition with 7 out of 10 correct. STS: 19e Meas: W (4)

G	438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)	16
G	439	G1-51 Do you perform tasks on DTL (diode transistor logic)	21
G	440	G1-52 Do you perform tasks on TTL (transistor transistor logic)	26
G	441	G1-53 Do you perform tasks on ECL/CML (emitter coupled or current mode logic)	7
G	443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)	21

0059 V 1b. Given a schematic drawing of gating curcuits, identify the output waveform at specified test points with 4 out of 5 correct. STS: 19e Meas: W (3)

A	95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)	74
A	104	A3-22 Do you perform tasks on zener diodes	69
G	412	G1-24 Do you trace data flow through logic symbol diagrams	57
G	413	G1-25 Do you trace data flow through logic schematic diagrams	57
G	419	G1-31 Do you perform tasks related to AND gates	63

D T Y	Tsk Nbr	Task Title	306 50
G	420	G1-32 Do you perform tasks related to OR gates	63
G	421	G1-33 Do you perform tasks related to inhibited gates logic functions	47
G	422	G1-34 Do you perform tasks related to NAND or NOR gates	62
G	423	G1-35 Do you perform tasks related to exclusive OR/NOR logic functions	60

0060 V 1c. Using a trainer and test equipment, identify malfunctioning components in integrated circuits; with 4 out of 5 correct, with a time limit of 10 minutes for each problem. STS: 19e Meas: P (2)

A	96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	69
A	104	A3-22 Do you perform tasks on zener diodes	69
G	415	G1-27 Do you troubleshoot digital systems subassemblies or circuit cards	57
G	416	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC	48
G	417	G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)	49
G	418	G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)	44
G	435	G1-47 Do you develop Boolean equations from logic circuits or diagrams	17

0061 V 3. Logic Circuits 22

0062 V 3a. Given schematic drawings of flip-flop circuits, identify functions and operational characteristics with 6 out of 8 correct. STS: 19d Meas: W (8)

B	161	B2-1 Do you use the oscilloscope to measure time to determine frequency	74
G	389	G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal	22
G	424	G1-36 Do you perform tasks related to RS flip flops	34
G	425	G1-37 Do you perform tasks related to D(Data) flip flops	43
G	426	G1-38 Do you perform tasks related to T(Toggle) flip flops	40
G	427	G1-39 Do you perform tasks related to JK flip flops	27
G	432	G1-44 Do you perform tasks related to inverters	53
G	488	G3-1 Do you trace data flow through circuits containing counters	54
G	491	G3-4 Do you perform tasks on UP counters in logic circuits	43

D T Y	Tsk Nbr	Task Title	306 50
G	492	G3-5 Do you perform tasks on DOWN counters in logic circuits	41
G	493	G3-6 Do you perform tasks on DECADE counters in logic circuits	24
G	494	G3-7 Do you perform tasks on ring counters in logic circuits	26
G	495	G3-8 Do you perform tasks on modulous counters in logic circuits	20
G	496	G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits	47
G	497	G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits	46
G	498	G3-11 Do you trace logic diagrams of circuits containing registers	49
G	501	G3-14 Do you perform tasks on shift registers in logic circuits	50
G	502	G3-15 Do you perform tasks on storage registers in logic circuits	43
G	503	G3-16 Do you trace data flow through combinational logic circuits	39
G	506	G3-19 Do you perform tasks on encoders	42
G	507	G3-20 Do you perform tasks on decoders	42

0063 V 3b. Using a trainer and test equipment, identify malfunctioning components and conditions in a logic circuit, with 4 out of 5 correct, with a time limit of 10 minutes for each problem. STS: 19d, 7c(1) Meas: P (14)

A	104	A3-22 Do you perform tasks on zener diodes	69
A	107	A3-25 Do you perform tasks on light emitting diodes (LED)	49
B	161	B2-1 Do you use the oscilloscope to measure time to determine frequency	74
B	162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	76
G	489	G3-2 Do you troubleshoot counter circuits to isolate a faulty counter	53
G	490	G3-3 Do you troubleshoot counters to circuit level components	50
G	499	G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register	47
G	500	G3-13 Do you troubleshoot registers to circuit level components	43
G	504	G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit	38
G	505	G3-18 Do you troubleshoot combinational logic circuits to circuit level components	34

D T Y	Tsk Nbr	Task Title		306 50
	0064	V 6. Soldering	8	
	0065	V 6a. Given a list of hazards of the electronics career field and a list precautions against those hazards, match the precaution to the hazard, with 4 out of 5 correct. STS: 7a, 7c(2) Meas: W	(1)	
	0066	V 6b. Given appropriate tools, use correct soldering procedures to remove, replace or repair detail parts. STS: 10f, 7c(2) Meas: P	(6)	
A	141	A5-1 Do you solder or desolder hardwire connections		96
A	142	A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc		88
A	143	A5-3 Do you solder or desolder printed circuit board connections		81
A	145	A5-5 Do you perform high reliability soldering		67
	0067	V 6c. Apply safety precaution during soldering operations. STS: 7c(2) Meas: P	(1)	

Tasks not referenced for duty A,
GENERAL ELECTRONIC/ELECTRICITY

A	12	A1-12 Do you calculate the value of a resistor required for a circuit	48
A	16	A1-16 Do you troubleshoot circuits to isolate a faulty relay	78
A	17	A1-17 Do you adjust relays	41
A	18	A1-18 Do you perform tasks on contacts, cores, coils, armatures, or springs	43
A	19	A1-19 Do you continuity check relays	58
A	25	A1-25 Do you calibrate or adjust circuits by using variable inductors	43
A	32	A1-32 Do you calibrate or adjust circuits using variable capacitors	43

D T Y	Tsk Nbr	Task Title	306 50
A	34	A1-34 Do you use capacitor color codes in your present job	23
A	39	A1-39 Do you calibrate or adjust circuits using variable transformers	25
A	42	A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers	29
A	43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer	27
A	44	A1-44 Do you adjust three phase transformers	17
A	45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors	23
A	46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor	23
A	47	A2-3 Do you troubleshoot DC motor component parts	13
A	48	A2-4 Do you perform tasks on DC motor component parts	14
A	49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors	23
A	50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor	22
A	51	A2-7 Do you troubleshoot AC motor component parts	11
A	52	A2-8 Do you perform tasks on AC motor component parts	14
A	53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	4
A	54	A2-10 Do you troubleshoot to isolate a faulty DC generator	4
A	55	A2-11 Do you troubleshoot DC generator component parts	4
A	56	A2-12 Do you perform tasks on component parts of DC generators	4
A	57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	4
A	58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	4
A	59	A2-15 Do you troubleshoot AC generator component parts	3
A	60	A2-16 Do you perform tasks on component parts of AC generators	3
A	61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	2
A	62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	1
A	63	A2-19 Do you troubleshoot alternator component parts	1
A	64	A2-20 Do you perform tasks on component parts of alternators	1
A	65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	7
A	66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	7
A	67	A2-23 Do you troubleshoot synchro or servo component parts	6
A	68	A2-24 Do you perform tasks on component parts of synchros or servos	6
A	69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers	2

D T Y	Tsk Nbr	Task Title	306 50
A	70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper	2
A	71	A2-27 Do you measure chopper coil excitation frequency	1
A	72	A2-28 Do you measure chopper coil voltage-current phase relationship	1
A	73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers	3
A	74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer	4
A	75	A2-31 Do you calibrate or adjust transducers	3
A	76	A2-32 Do you repair, clean or lubricate transducers	3
A	77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids	7
A	78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid	7
A	79	A2-35 Do you perform maintenance on solenoid component parts	4
A	80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	27
A	81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement	26
A	82	A2-38 Do you perform maintenance on meter movement mechanical parts	12
A	86	A3-4 Do you use diode characteristic curves	16
A	92	A3-10 Do you check transistors using transistor testers	50
A	93	A3-11 Do you use transistor characteristic curves	16
A	94	A3-12 Do you use transistor substitution information	40
A	97	A3-15 Do you use IC substitution information	36
A	99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device	51
A	100	A3-18 Do you perform tasks on varactors/varicaps	28
A	101	A3-19 Do you perform tasks on tunnel diodes	23
A	105	A3-23 Do you perform tasks on liquid crystal displays (LCD)	26
A	106	A3-24 Do you perform tasks on pin diodes	17
A	108	A3-26 Do you perform tasks on fantail transistors	12
A	110	A3-28 Do you perform tasks on triacs	9
A	111	A3-29 Do you perform tasks on programmable unijunction transistors (PUT)	7
A	112	A3-30 Do you perform tasks on silicon controlled switches (SCS)	12
A	113	A3-31 Do you perform tasks on silicon unilateral switches (SUS)	6
A	114	A3-32 Do you perform tasks on step recovery diodes (SRD)	7
A	115	A3-33 Do you perform tasks on field effect diodes (FED)	14
A	116	A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode)	6
A	117	A3-35 Do you perform tasks on varistors	51
A	118	A3-36 Do you perform tasks on metal oxide varistors (MOV)	7
A	119	A3-37 Do you perform tasks on schottky diodes	5
A	120	A4-1 Do you trace block diagrams of circuits containing electron tubes	32

D T Y	Tsk Nbr	Task Title	306 50
A	121	A4-2 Do you trace schematic diagrams of electron tube circuits	31
A	122	A4-3 Do you troubleshoot circuits to isolate a faulty electron tube	31
A	123	A4-4 Do you use electron tube characteristic curves	8
A	124	A4-5 Do you use electron tube substitution manuals or charts	14
A	125	A4-6 Do you perform tasks on diode tubes	21
A	126	A4-7 Do you perform tasks on triode tubes	23
A	127	A4-8 Do you perform tasks on tetrode tubes	22
A	128	A4-9 Do you perform tasks on pentode tubes	21
A	129	A4-10 Do you perform tasks on beam power tubes	3
A	130	A4-11 Do you perform tasks on gas tubes	13
A	131	A4-12 Do you perform tasks on phantastrons	2
A	132	A4-13 Do you perform tasks on neon tubes	6
A	133	A4-14 Do you perform tasks on xenon tubes	3
A	134	A4-15 Do you perform tasks on nixie tubes	3
A	135	A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT)	6
A	136	A4-17 Do you trace schematic diagrams of CRT circuits	6
A	137	A4-18 Do you troubleshoot to isolate a faulty CRT	6
A	138	A4-19 Do you adjust or calibrate circuits that control CRT operations	6
A	139	A4-20 Do you perform tasks on electrostatic CRT	4
A	140	A4-21 Do you perform tasks on electromagnetic CRT	2
A	144	A5-4 Do you solder or desolder multi-layer circuit board connections	25
A	146	A5-6 Do you use crimping tool to repair or make connections	88
A	147	A5-7 Do you use wire wrap tool to make connections	71
A	148	A5-8 Do you use punch-on tool to make connections	62
A	149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables	70
A	150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables	72
A	151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables	31
A	152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables	30

Tasks not referenced for duty B,
TEST EQUIPMENT

B	155	B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts	19
B	158	B1-6 Do you use the multimeter to extend the range of ammeters using external shunts	14
B	166	B2-6 Do you use the oscilloscope to measure phase jitters	42

D T Y	Tsk Nbr	Task Title	306 50
B	168	B2-8 Do you use the oscilloscope to observe lissajous patterns	62
B	171	B2-11 Do you use delay time multipliers with oscilloscopes	25
B	173	B3-2 Do you use SG to perform alignments, adjustments, or calibrations	60
B	175	B3-4 Do you use audio sine-wave signal generators	54
B	176	B3-5 Do you use audio non-sinusoidal signal generators	17
B	177	B3-6 Do you use RF less than 1,000MH signal generators	19
B	178	B3-7 Do you use RF greater than 1,000MH signal generators	9
B	179	B3-8 Do you use white noise signal generators	7
B	180	B3-9 Do you use pattern signal generators	33
B	181	B3-10 Do you use pseudo-random signal generators	12
B	182	B3-11 Do you use time mark signal generators	11
B	184	B3-13 Do you use TV signal signal generators	3
B	185	B4-1 Do you use frequency counters	83
B	186	B4-2 Do you use spectrum analyzers	15
B	187	B4-3 Do you use field strength testers	3
B	189	B4-5 Do you use digital logic probes	17
B	190	B4-6 Do you use capacitance testers	17
B	191	B4-7 Do you use capacitor substitution boxes	5
B	192	B4-8 Do you use DC restorers (CRT rejuvinators)	4
B	193	B4-9 Do you use logic current tracers	6
B	194	B4-10 Do you use tube testers	13
B	195	B4-11 Do you use logic pulsers	6
B	196	B4-12 Do you use logic analyzers	8
B	197	B4-13 Do you use signature analyzers	4
B	198	B4-14 Do you use reflectometers	4

Tasks not referenced for duty C,
AMPLIFIER CIRCUITS

C	204	C1-6 Do you adjust or align transistor amplifiers	38
C	207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	11
C	209	C1-11 Do you work on paraphase transistor amplifiers	11
C	212	C1-14 Do you work on wideband transistor amplifiers	28
C	213	C1-15 Do you work on IF transistor amplifiers	12
C	214	C1-16 Do you work on RF transistor amplifiers	17
C	215	C1-17 Do you work on buffer transistor amplifiers	44
C	216	C1-18 Do you work on complementary symmetry transistor amplifiers	8
C	217	C1-19 Do you work on DC transistor amplifiers (switching applications)	42
C	223	C2-6 Do you perform tasks on diode stabilization amplifiers	33
C	224	C2-7 Do you perform tasks on double diode stabilization amplifiers	14
C	233	C3-9 Do you perform tasks on optical coupling circuits	9

D T Y	Tsk Nbr	Task Title	306 50
C	234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	17
C	235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	18
C	236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	18
C	237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	17
C	238	C4-5 Do you troubleshoot electron tube amplifier distortion	11
C	239	C4-6 Do you adjust or align electron tube amplifiers	12
C	240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	13
C	241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	7
C	242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	4
C	243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	11
C	244	C4-11 Do you perform tasks on audio electron tube amplifiers	6
C	245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	16
C	246	C4-13 Do you perform tasks on common grid electron tube amplifiers	15
C	247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	16
C	248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	13
C	250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	40
C	252	C5-4 Do you adjust op amp bias, offsets, or drift	21
C	255	C5-7 Do you use or apply operational amplifiers for summing	9
C	256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	20
C	257	C5-9 Do you use or apply operational amplifiers as active filters	19
C	258	C5-10 Do you use or apply operational amplifiers as oscillators	30
C	259	C5-11 Do you use or apply operational amplifiers as integrators	13
C	261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	41
C	262	C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	37
C	263	C5-15 Do you use or apply operational amplifiers as multivibrators	37
C	264	C5-16 Do you use or apply operational amplifiers as modulators/demodulators	33
C	265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	4

D T Tsk Y Nbr	Task Title	306 50
C 266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	4
C 267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	3
C 268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	3
C 269	C6-5 Do you adjust magnetic amplifiers or components	2
C 270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	3
C 271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	3
C 272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	3
C 273	C6-9 Do you troubleshoot saturable reactors to circuit level components	3
C 274	C6-10 Do you adjust saturable reactor circuits or components	2

Tasks not referenced for duty D,
POWER SUPPLIES

D 283	D1-9 Do you perform tasks on three-phase rectifier power supplies	23
D 285	D1-11 Do you perform tasks on DC to DC converters	60
D 287	D1-13 Do you perform tasks on switching power supplies	16
D 303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	64
D 304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	62
D 305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	53
D 306	D3-8 Do you perform tasks on IC power supply voltage regulators	31
D 307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	20
D 309	D3-11 Do you perform tasks on crow bar power supply voltage regulators	10

Tasks not referenced for duty E,
REACTIVE CIRCUITS

E 315	E1-6 Do you calculate phase angle of RCL circuits	9
E 316	E1-7 Do you calculate values of power in RCL circuits	10
E 320	E2-4 Do you align or adjust frequency sensitive filters	23
E 321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	11

D T Y	Tsk Nbr	Task Title	306 50
E	326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters	4

Tasks not referenced for duty F,
WAVESHAPING/GENERATING CIRCUITS

F	329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit	65
F	330	F1-4 Do you troubleshoot oscillators to circuit level components	59
F	335	F1-9 Do the oscillators you work with use phase lock loops (PLL)	17
F	339	F1-13 Do you perform tasks on Clapp oscillator circuits	11
F	340	F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	17
F	341	F1-15 Do you perform tasks on crystal oscillator circuits	60
F	342	F1-16 Do you perform tasks on Wien bridge oscillator circuits	7
F	343	F1-17 Do you perform tasks on pulse generating oscillator circuits	22
F	344	F1-18 Do you perform tasks on blocked/blocking oscillator circuits	6
F	345	F1-19 Do you perform tasks on burst generators	6
F	346	F1-20 Do you perform tasks on RC phase shift oscillators	16
F	349	F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit	62
F	350	F2-4 Do you troubleshoot multivibrators to circuit level components	56
F	352	F2-6 Do the multivibrators you work with use LC tank circuits	40
F	354	F2-8 Do the multivibrators you work with use Crystals	45
F	358	F2-12 Do you perform tasks on triggered astable multivibrators	46
F	361	F3-3 Do you trouble-hoot to isolate a faulty WSC	46
F	362	F3-4 Do you troubleshoot WSC to circuit level components	42
F	365	F3-7 Do you perform tasks on trapazoidal (ramp) wave generator WSC	11
F	370	F3-12 Do you perform tasks on square wave generator WSC	44
F	371	F3-13 Do you perform tasks on rectangular wave generator WSC	22
F	373	F4-1 Do you trace block diagrams of circuits containing limiters	44
F	375	F4-3 Do you trace block diagrams of circuits containing clampers	39
F	379	F4-7 Do you troubleshoot to isolate a faulty clamper circuit	35
F	380	F4-8 Do you troubleshoot clampers to circuit level components	33
F	385	F4-13 Do you perform tasks on transistor limiter circuits	30
F	386	F4-14 Do you perform tasks on triode limiter circuits	12

D T Y	Tsk Nbr	Task Title	306 50
		Tasks not referenced for duty G, COMPUTERS, DIGITAL CIRCUITS, AND DEVICES	
G	390	G1-2 Do you convert octal numbers to binary or binary numbers to octal	12
G	391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	19
G	392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	10
G	393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	19
G	394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	11
G	395	G1-7 Do you convert base number fractions to another base numbering system	9
G	396	G1-8 Do you add binary numbers	20
G	397	G1-9 Do you subtract binary numbers	18
G	398	G1-10 Do you multiply binary numbers	12
G	399	G1-11 Do you divide binary numbers	11
G	400	G1-12 Do you add octal numbers	9
G	401	G1-13 Do you subtract octal numbers	9
G	402	G1-14 Do you add hexadecimal numbers	14
G	403	G1-15 Do you subtract hexadecimal numbers	13
G	404	G1-16 Do you use binary coded decimal (BCD)	14
G	405	G1-17 Do you use gray codes	2
G	406	G1-18 Do you use ICAO codes	1
G	407	G1-19 Do you use excess-3 (XS3) codes	1
G	408	G1-20 Do you use parity bit codes	12
G	409	G1-21 Do you use biquinary codes	2
G	410	G1-22 Do you use ASCII codes	20
G	411	G1-23 Do you use EBCDI codes	3
G	414	G1-26 Do you troubleshoot digital systems to major units	55
G	430	G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")	31
G	431	G1-43 Do you perform tasks related to buffers	46
G	433	G1-45 Do you perform tasks related to complemented flip flops	26
G	434	G1-46 Do you perform tasks related to complementing flip flops	26
G	436	G1-48 Do you develop logic diagrams from Boolean equations	17
G	437	G1-49 Do you simplify Boolean expressions using Boolean algebra	18
G	442	G1-54 Do you perform tasks on HTL (high threshold logic)	6
G	444	G1-56 Do you perform tasks on positive MOS ICs	10
G	445	G1-57 Do you perform tasks on negative MOS ICs	9
G	446	G1-58 Do you perform tasks on vertical MOS ICs	6

D T Y	Tsk Nbr	Task Title	306 50
G	447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems	13
G	448	G2-2 Do you load programs	16
G	449	G2-3 Do you write or debug programs	6
G	450	G2-4 Do you troubleshoot computers to a major unit	14
G	451	G2-5 Do you troubleshoot computers to a subassembly or circuit card	14
G	452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC	6
G	453	G2-7 Do you use computer flow charts or diagrams	11
G	454	G2-8 Do you perform tasks on analog computers	7
G	455	G2-9 Do you perform tasks on digital computers	18
G	456	G2-10 Do you use Basic computer language	9
G	457	G2-11 Do you use COBOL computer language	2
G	458	G2-12 Do you use FORTRAN computer language	0
G	459	G2-13 Do you use ADA computer language	1
G	460	G2-14 Do you use ATLAS computer language	0
G	461	G2-15 Do you use ELAN computer language	0
G	462	G2-16 Do you use PASCAL computer language	1
G	463	G2-17 Do you use RPG computer language	0
G	464	G2-18 Do you use Machine computer language	5
G	465	G2-19 Do you use C computer language	0
G	466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories	15
G	467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories	14
G	468	G2-22 Do you perform tasks on paper (tape, punch card) computer memories	2
G	469	G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories	2
G	470	G2-24 Do you perform tasks on computer keyboards	17
G	471	G2-25 Do you perform tasks on computer character printers	11
G	472	G2-26 Do you perform tasks on magnetic tape drives	9
G	473	G2-27 Do you perform tasks on microprocessor computer terminals	9
G	474	G2-28 Do you perform tasks on video display unit (VDU/ monitors)	11
G	475	G2-29 Do you perform tasks on paper tape readers/punches	4
G	476	G2-30 Do you perform tasks on paper card readers/punches	1
G	477	G2-31 Do you perform tasks on toggle or push button switch inputs	8
G	478	G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	7
G	479	G2-33 Do you perform tasks on modems	26
G	480	G2-34 Do you perform tasks on line printers	9
G	481	G2-35 Do you perform tasks on floppy disc drives	9
G	482	G2-36 Do you perform tasks on removable cartridge disc drives	4
G	483	G2-37 Do you perform tasks on removable pack disc drives	3

D T Y	Tsk Nbr	Task Title	306 50
G	484	G2-38 Do you perform tasks on fixed winchester type disc drives	3
G	485	G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	9
G	486	G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	10
G	487	G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	6
G	508	G3-21 Do you perform tasks on multiplexers	31
G	509	G3-22 Do you perform tasks on demultiplexers	24
G	510	G3-23 Do you perform tasks on comparators	32
G	511	G3-24 Do you perform tasks on parity generators or checkers	20
G	512	G3-25 Do you perform tasks on code converters	17
G	513	G3-26 Do you perform tasks on adders	38
G	514	G3-27 Do you perform tasks on subtractors	19
G	515	G3-28 Do you perform tasks on count detect circuits	16
G	516	G4-1 Do you trace data flow through A/D converters	41
G	517	G4-2 Do you trace data flow through D/A converters	41
G	518	G4-3 Do you troubleshoot A/D converter circuits	36
G	519	G4-4 Do you troubleshoot D/A converter circuits	36
G	520	G4-5 Do the converters you perform tasks on use flash conversion	3
G	521	G4-6 Do the converters you perform tasks on use successive approximation conversion	8
G	522	G4-7 Do the converters you perform tasks on use ramp conversion	3
G	523	G4-8 Do the converters you perform tasks on use R2R conversion	3

Tasks not referenced for duty H,
TRANSMISSION/RECEPTION CIRCUITS, DEVICES, AND SYSTEMS

H	524	H1-1 Do you measure electrical length on transmission lines	6
H	525	H1-2 Do you measure physical length on transmission lines	8
H	526	H1-3 Do you measure standing wave ratio (SWR) on transmission lines	5
H	527	H1-4 Do you construct transmission lines	9
H	528	H1-5 Do you match transmission line impedance with loads	17
H	529	H1-6 Do you calculate the characteristic impedance (ZO) of transmission lines	6
H	530	H1-7 Do you troubleshoot transmission lines	25
H	531	H1-8 Do you perform tasks on open-wire transmission lines	13
H	532	H1-9 Do you perform tasks on twisted pair transmission lines	26
H	533	H1-10 Do you perform tasks on twin lead transmission lines	15
H	534	H1-11 Do you perform tasks on flexible coaxial transmission lines	14

D T Y	Tsk Nbr	Task Title	306 50
H	535	H1-12 Do you perform tasks on rigid coaxial transmission lines	8
H	536	H1-13 Do you perform tasks on fiber-optic transmission lines	9
H	537	H1-14 Do you trace schematic or block diagrams of circuits containing waveguides	1
H	538	H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly	1
H	539	H1-16 Do you pressurize or purge waveguide assemblies	1
H	540	H1-17 Do you measure standing wave ratio for waveguide assemblies	1
H	541	H1-18 Do you remove or install waveguide or associated coupling hardware components	1
H	542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	1
H	543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	1
H	544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	0
H	545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	0
H	546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	0
H	547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	0
H	548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	0
H	549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	0
H	550	H2-9 Do you perform tasks on backward wave oscillator	0
H	551	H2-10 Do you perform tasks on parametric amplifiers	0
H	552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	0
H	553	H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	1
H	554	H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	1
H	555	H3-3 Do you tune or adjust resonant cavities electrically	1
H	556	H3-4 Do you tune or adjust resonant cavities physically	1
H	557	H3-5 Do you measure frequency of resonant cavities	1
H	558	H3-6 Do you perform tasks on probe resonant cavities	0
H	559	H3-7 Do you perform tasks on loop resonant cavities	0
H	560	H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	0
H	561	H4-1 Do you use "AM" modulation principles	3
H	562	H4-2 Do you trace block diagrams of AM transmitters	3
H	563	H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	3
H	564	H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuits cards	3
H	565	H4-5 Do you troubleshoot AM transmitters to major units	3

D T Y	Tsk Nbr	Task Title	306 50
H	566	H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	3
H	567	H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	2
H	568	H4-8 Do you align or adjust AM transmitters or circuits	3
H	569	H4-9 Do you calculate percentage of modulation for AM transmitters	1
H	570	H4-10 Do you use "AM" demodulation principles	2
H	571	H4-11 Do you trace block diagrams of AM receivers	2
H	572	H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	2
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	2
H	574	H4-14 Do you troubleshoot AM receivers to major units	2
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	2
H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	1
H	577	H4-17 Do you align or adjust AM receivers or circuits	2
H	578	H4-18 Do you trace block diagrams of single side band (SSB) transmitters	2
H	579	H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	1
H	580	H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	1
H	581	H4-21 Do you troubleshoot SSB transmitters to major units	2
H	582	H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	1
H	583	H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	1
H	584	H4-24 Do you align or adjust SSB transmitters or circuits	1
H	585	H4-25 Do you calculate percentage of modulation for SSB transmitters	0
H	586	H4-26 Do you trace block diagrams of SSB receivers	2
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	1
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	1
H	589	H4-29 Do you troubleshoot SSB receivers to major units	2
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards	1
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	1
H	592	H4-32 Do you align or adjust SSB receivers or circuits	1
H	593	H4-33 Do you use "FM" modulation principles	4
H	594	H4-34 Do you trace block diagrams of FM transmitters	4
H	595	H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards	3
H	596	H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	3

D T Y	Tsk Nbr	Task Title	306 50
H	597	H4-37 Do you troubleshoot FM transmitters to major units	3
H	598	H4-38 Do you troubleshoot FM transmitters to sub-assemblies or circuit cards	3
H	599	H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards or circuit level components	2
H	600	H4-40 Do you align or adjust FM transmitters or circuits	3
H	601	H4-41 Do you calculate modulation index for FM transmitters	1
H	602	H4-42 Do you measure frequency deviation for FM transmitters	2
H	603	H4-43 Do you use "FM" demodulation principles	3
H	604	H4-44 Do you trace block diagrams of FM receivers	3
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	2
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	2
H	607	H4-47 Do you troubleshoot FM receivers to major units	2
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	2
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	1
H	610	H4-50 Do you align or adjust FM receivers or circuits	2
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	0
H	612	H4-52 Do you use "PM" modulation principles	2
H	613	H4-53 Do you trace block diagrams of PM transmitters	2
H	614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	2
H	615	H4-55 Do you trace schematic diagrams of PM trans-mitter subassemblies or circuit cards	2
H	616	H4-56 Do you troubleshoot PM transmitters to major units	2
H	617	H4-57 Do you troubleshoot PM transmitters to sub-assemblies or circuit cards	2
H	618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	2
H	619	H4-59 Do you align or adjust PM transmitters or circuits	2
H	620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	0
H	621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	1
H	622	H4-62 Do you use "PM" demodulation principles	2
H	623	H4-63 Do you trace block diagrams of PM receivers	2
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	2
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	2
H	626	H4-66 Do you troubleshoot PM receivers to major units	2
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	2
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	1
H	629	H4-69 Do you align or adjust PM receivers or circuits	2

D T Y	Tsk Nbr	Task Title	306 50
H	630	H5-1 Do you physically align antennas	6
H	631	H5-2 Do you electrically align antennas	3
H	632	H5-3 Do you troubleshoot loading of antennas	2
H	633	H5-4 Do you troubleshoot coupling of antennas	3
H	634	H5-5 Do you plot graph radiation patterns	1
H	635	H5-6 Do you troubleshoot antenna components	3
H	636	H5-7 Do you measure standing wave ratio (SWR) for antennas	1
H	637	H5-8 Do you work with Yagi antennas	1
H	638	H5-9 Do you work with dipole antennas	3
H	639	H5-10 Do you work with slotted antennas	1
H	640	H5-11 Do you work with rotary antennas	2
H	641	H5-12 Do you work with hertz antennas	0
H	642	H5-13 Do you work with marconi antennas	0
H	643	H5-14 Do you work with rhombic antennas	0
H	644	H5-15 Do you work with scimitar antennas	0
H	645	H5-16 Do you work with parabolic antennas	1
H	646	H5-17 Do you work with ground plane antennas	1
H	647	H5-18 Do you perform tasks on rotary antenna arrays	1
H	648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	0
H	649	H5-20 Do you perform tasks on broadside antenna arrays	1
H	650	H5-21 Do you perform tasks on cardioid antenna arrays	1
H	651	H5-22 Do you perform tasks on collinear antenna arrays	0
H	652	H5-23 Do you perform tasks on phase antenna arrays	1
H	653	H5-24 Do you perform tasks on planar antenna arrays	0
H	654	H5-25 Do you perform tasks on antennas with vertical polarization	2
H	655	H5-26 Do you perform tasks on antennas with horizontal polarization	2
H	656	H5-27 Do you perform tasks on antennas with circular polarization	1
H	657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	3
H	658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	3
H	659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	3

Tasks not referenced for duty I,
RADIO FREQUENCY (RF) MEASUREMENTS OR CALCULATIONS

I	660	I1-1 Do you measure RF power	3
I	661	I1-2 Do you measure RF peak power	2
I	662	I1-3 Do you measure RF average power	2
I	663	I1-4 Do you measure RF effective power	1
I	664	I1-5 Do you measure RF output power using wattmeters	2
I	665	I2-1 Do you calculate RF apparent power	1
I	666	I2-2 Do you calculate RF true power	1

D T Y	Tsk Nbr	Task Title	306 50
I	667	I2-3 Do you calculate RF power loss or gain in db	3

Tasks not referenced for duty J,
ADDITIONAL CIRCUITS, DEVICES, SYSTEMS, OR ITEMS

J	668	J1-1 Do you trace block diagrams of circuits containing microphones	19
J	669	J1-2 Do you trace schematic diagrams of microphone circuits	18
J	670	J1-3 Do you troubleshoot to isolate a faulty microphone	21
J	671	J1-4 Do you troubleshoot microphones	11
J	672	J1-5 Do you work on carbon microphones	17
J	673	J1-6 Do you work on capacitor microphones	4
J	674	J1-7 Do you work on crystal microphones	5
J	675	J1-8 Do you work on dynamic microphones	12
J	676	J1-9 Do you work on velocity ribbon microphones	3
J	677	J1-10 Do you trace block diagrams of circuits containing speakers	20
J	678	J1-11 Do you trace schematic diagrams of speaker circuits	18
J	679	J1-12 Do you troubleshoot to isolate a faulty speaker	19
J	680	J1-13 Do you troubleshoot speakers	10
J	681	J2-1 Do you trace block diagrams of circuits containing photosensitive devices	3
J	682	J2-2 Do you trace schematic diagrams of photosensitive device circuits	3
J	683	J2-3 Do you troubleshoot to isolate a faulty photosensitive device	3
J	684	J2-4 Do you adjust or calibrate photosensitive devices	1
J	685	J2-5 Do you work on photodiodes	3
J	686	J2-6 Do you work on phototransistors	2
J	687	J2-7 Do you work on phototubes	0
J	688	J2-8 Do you work on photo-SCRs	0
J	689	J2-9 Do you work on photocells (Photoconductive or Photovoltaic)	1
J	690	J3-1 Do you trace block diagrams of circuits containing display tubes	0
J	691	J3-2 Do you trace schematic diagrams of display tubes or circuits	0
J	692	J3-3 Do you troubleshoot to isolate a faulty display tube	0
J	693	J3-4 Do you adjust or calibrate display tubes or circuits	0
J	694	J3-5 Do you work on direct view storage tubes (DVST)	0
J	695	J3-6 Do you work on multiple mode storage tubes (MMST)	0
J	696	J3-7 Do you work on scan converter tubes (SCT)	0
J	697	J4-1 Do you trace block diagrams of TV systems or subassemblies	0
J	698	J4-2 Do you trace schematic diagrams of TV systems or component circuits	0

D T Y	Tsk Nbr	Task Title	306 50
J	699	J4-3 Do you troubleshoot TV systems to major subassemblies	0
J	700	J4-4 Do you troubleshoot TV systems to circuit level components	0
J	701	J4-5 Do you adjust or calibrate TV systems or components	0
J	702	J4-6 Do you trace block diagrams of laser systems or subassemblies	0
J	703	J4-7 Do you trace schematic diagrams of laser systems or component circuits	0
J	704	J4-8 Do you troubleshoot laser systems to major subassemblies	0
J	705	J4-9 Do you troubleshoot laser systems to circuit level components	0
J	706	J4-10 Do you adjust or calibrate laser systems or components	0
J	707	J4-11 Do you trace block diagrams of infrared systems or subassemblies	1
J	708	J4-12 Do you trace schematic diagrams of infrared systems or component circuits	0
J	709	J4-13 Do you troubleshoot infrared systems to major subassemblies	0
J	710	J4-14 Do you troubleshoot infrared systems circuit level components	0
J	711	J4-15 Do you inspect, clean, or service infrared systems or components	1
J	712	J4-16 Do you adjust or calibrate infrared systems or components	0